# YLCA/YLHA PLUS 5 to 27 R-410A

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## Technical Information

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AENOR Gestión Ambiental CGM-97/013 ISO 14001

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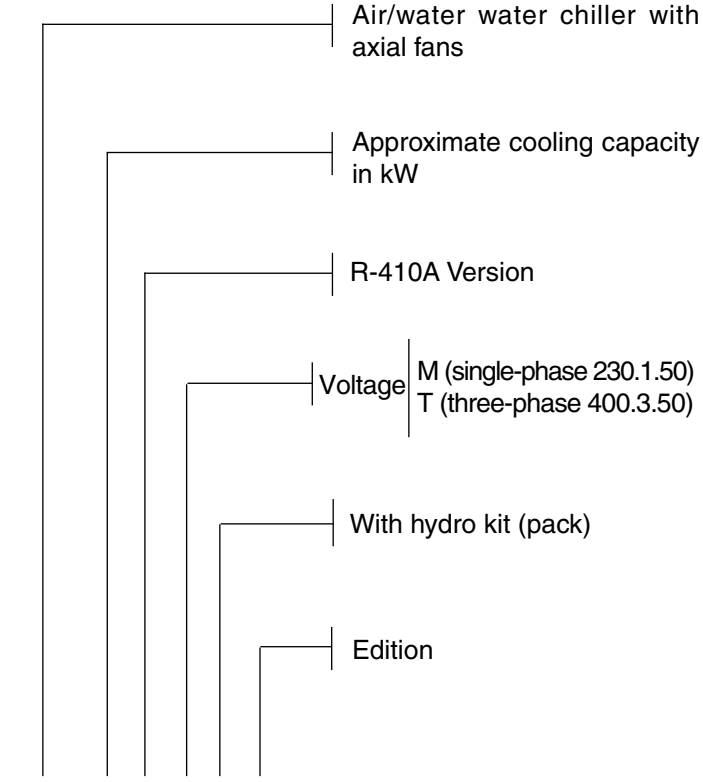
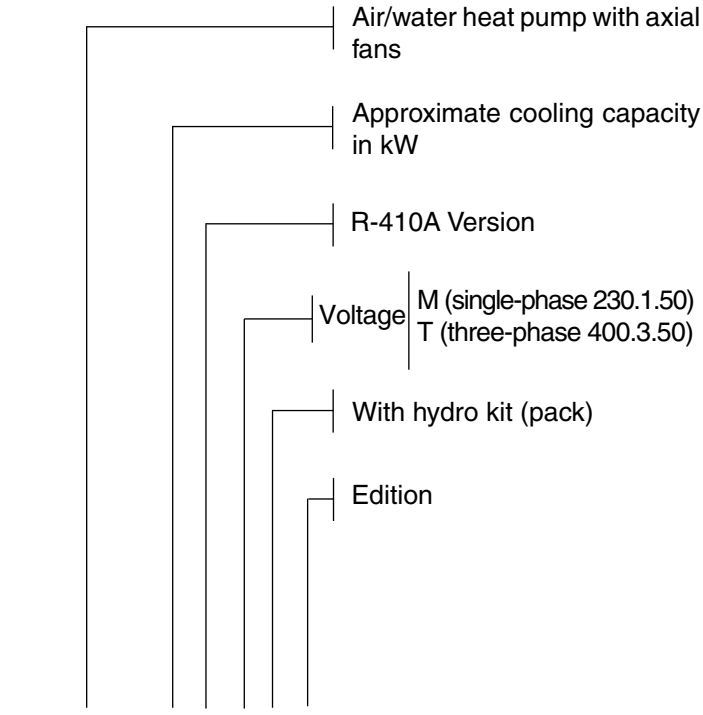
# General Information

## Nomenclature




YLCA 5 G1 T C E1




YLHA PLUS 5 G1 T C E1

## General description

The YLCA/YLHA PLUS 5 to 27 units are high-performance air-water water chillers and heat pumps using R-410A ecological refrigerant.

These units are designed for air conditioning or industrial applications that require cold or hot water. They are silent and compact units, equipped with axial fans, and can be installed directly outdoors. Buffer tanks are available as accessories for installations that require a larger water volume.

The control system of these units is a specially programmed electronic controller to be used on air-water water chillers and heat pumps.

Easy and safe to use, this control system precision-controls the water return temperature of the installation, carries out defrost cycles, modulates fan speeds and controls the compressor, pump and electric heater start-ups. By reading the control probes and safety elements, the controller protects the entire equipment against malfunctions. The system allows connecting the unit to a standard RS485 monitoring network. For further information, please see Operating Instructions.

The YLCA/YLHA PLUS 5 to 27 units are made of proven quality components and manufactured in compliance with standards in force (ISO 9001 certification).

## Models available and capacities

| Cool only model | **YLCA-5 M** | **YLCA-7 M & T** | **YLCA-9 M & T** | **YLCA-12 M & T** |
|---|---|---|---|---|
| Cooling capacity (kW) | 5.38 | 7.13 | 8.63 | 12.40 |

| Cool only model | **YLCA-15 T** | **YLCA-20 T** | **YLCA-27 T** |
|---|---|---|---|
| Cooling capacity (kW) | 14.50 | 19.52 | 25.60 |

| Heat pump model | **YLHA PLUS-5 M** | **YLHA PLUS-7 M & T** | **YLHA PLUS-9 M & T** |
|---|---|---|---|
| Cooling capacity (kW) | 5.4 | 7.10 | 8.7 |
| Heating capacity (kW) | 6.30 | 7.16 | 9.52 |

| Heat pump model | **YLHA PLUS-12 M & T** | **YLHA PLUS-15 T** | **YLHA PLUS-20 T** | **YLHA PLUS-27 T** |
|---|---|---|---|---|
| Cooling capacity (kW) | 11.75<br>12 | 13.8 | 19.4 | 25.80 |
| Heating capacity (kW) | 12.25<br>12.4 | 16.1 | 20.9 | 27.50 |

**Cooling capacities in kW for 12/7° C entering/leaving water temperature, and 35° C ambient temperature.**

**Heating capacities in kW for 40/45° C entering/leaving water temperature, and 7° C ambient temperature.**

## Features and advantages

| Features | Advantages |
|---|---|
| R-410A refrigerant | Does not harm the ozone layer. |
| Minimum dimensions | Minimum footprint. |
| Low height and weight | Space for installing on terraces. |
| Factory tested equipment | Operating quality control. |
| Accessibility | Easy maintenance. |
| Main switch | Operator safety. |
| Microprocessor for control and alarms | Easy and safe operation. |
| Manufactured to ISO 9001 | High quality level. |
| Variable speed fan | Low noise level and condensation control. |
| Possibility of eliminating the buffer tank | For installations with low water volume. |
| Communications connection | Ideal for building management. |

## Dynamic set point and suppression of buffer tank

The YLCA/YLHA PLUS 5 to 27 control system has *Dynamic Set Point and Suppression of Buffer Tank functions.*
*Dynamic Set Point*. Modifies water temperature control set point in accordance with the outdoor temperature. The purpose of this is to avoid excessive an temperature differential between the indoor and outdoor air conditioned areas. If this differential is excessive, it could cause discomfort and thermal shock that could be detrimental to the health of the users entering and leaving this area. On the other hand, this function, that increases the set point in winter cycle and lowers it in summer cycle, contributes considerably to saving energy.
*Suppression of Buffer Tank.* This function increases the temperature differential that, added to the control set point, controls the on/off cycles of the compressor when the unit is operating at a low charge. To achieve this, the reference point used is the duration of the compressor operating cycles. In this way, when the water temperature falls quickly, it delays the compressor off cycle by simulating the buffer tank operation, thus avoiding excessive on/off cycles of the unit. Although this function slightly decreases water temperature control precision, it eliminates the need to use the buffer tank.

# Technical Specifications

These units are supplied completely factory-assembled and with all refrigerant tubing and wiring ready for installation on the job site. After installation, these units must go through an operational test with water. Refrigerant leaks will also be checked during this process.

### Sheeting casing

The units are made of galvanized steel sheeting and anticorrosion nuts and bolts. Panels can be removed for access to internal components. The casing parts are painted with white RAL9001 oven-baked polymerized enamel.

### Compressor

Hermetic Scroll compressors mounted on antivibratory supports are used. These compressors are equipped with electronic modules that protect them against high operating temperatures. The sump heater operates (units only 20 to 27) only when the compressor is inoperative.

### Indoor heat exchanger

Comprises a stainless steel plate exchanger, adequately insulated by a layer of closed-cell elastomer foam. The refrigerant side of said exchanger accepts an operating pressure of 52 bar, whereas the water side accepts 10 bar. When the unit includes a hydro kit, maximum admissible pressure on the water side is 6 bar (adjustment of the relief valve).

### Outdoor heat exchanger

Made up of notched blue fin aluminium, fin coils and grooved copper tubing mechanically expanded within the fin assembly.

### Fans

Of the axial and low sound level type. Equipped with single-phase motors with IP54 protection. These motors allow speed control by means of a phase cut-out shifter controlled by the unit controller. This allows unit operation at low ambient temperatures (-10°C).
An optional low ambient temperature kit (pressure sensor) can reach -18°C. This kit is included as standard on heat pump models YLHA PLUS. On heat pumps, the fan will remain inoperative during defrosts.

### Electric and control panel

Located inside the unit, and with IP44 protection. The operating and control components are factory mounted, wired and tested. This control panel is equipped with a locking isolator that turns power supply off. Inside we find the contactors for the compressor and the pump, the transformer, magneto-thermal protector, speed control, connecting strip and the keyboard-display with the unit controls.

### Control keyboard-display

This device is accessible through an external leak-tight plastic cover. This is an easy-to-use control with three access levels: Direct, User (password) and Factory (password). For further information, please see Operating Instructions.

**Cooling circuit**
*Cool only unit:* Includes Schrader valves on the high, low and liquid sides, high and low pressure switches, filter-dryer, expansion valve (YLCA- 5 to 15), expansion valve and liquid sight glass (YLCA 20 to 27), and service valves for isolating the condensing unit (*pump down*) (YLCA 27).
*Heat pump unit:* Includes Schrader valves on the high and low sides, high and low pressure switches, filter-dryer, two expansion valves (YLHA PLUS 5 to 15), two expansion valves and liquid sight glass (YLHA PLUS 20 to 27), service valves for isolating the condensing unit (*pump down*) (YLHA PLUS 27), liquid tank, four-way valve (energized in summer cycle) and check valves (YLHA PLUS 20 to 27). The suction tubing is coated with closed-cell elastomer.

**Hydro kit**
These units include a pack assembled with the components of a hydro kit. This assembly is located within the unit frame and does not increase the footprint of same. It includes the following components: Centrifugal pump, expansion vessel charged with nitrogen at 1.5 bar, relief valve set to 6 bar, flow switch, air bleed valve and drain connection. Also includes a mesh filter for the water circuit. This filter is supplied loose for installation at the most convenient point.

**Protecting grids**
To protect the coils from possible impacts. Made of steel rods and painted with oven baked polymerized white enamel (RAL9001).

## Accessories and options

**Remote control unit**
Wall-mounted remote control unit with keyboard for cool/heat and ON/OFF functions. Includes power supply, alarm and cool/heat LEDs. Maximum cable length: 50 m.

**Remote terminal**
For total access and control of the system by means of the display and keys. Allows selecting cool, heat and off functions. Can also modify operating parameters and monitor the system. Can be installed at a maximum distance of 1040 m.

**BMS connections**
By means of a serial board, it is possible to connect the system to a standard RS485 monitoring network.

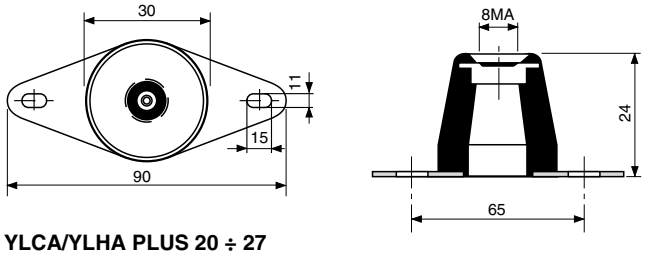
**Low ambient temperature kit (YLCA 5 to 15)**
Includes a pressure transducer for controlling condensing pressure at low ambient temperature (-18°C).
Standard on models YLCA 20 & 27, and YLHA PLUS 5-27.

**High pressure fans**

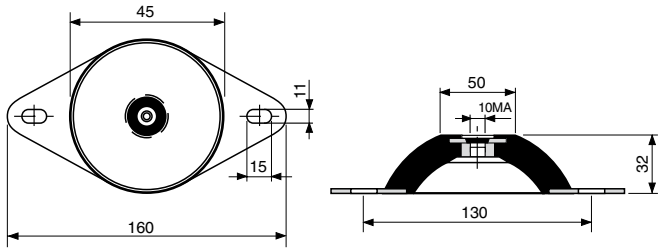
**Buffer tank**
With a backup heater installed.

**Antivibratory supports**
Whenever necessary to reduce to a maximum vibrations and noise caused by the unit, you can use a set of caoutch antivibratory supports, that should be installed between the supporting chassis of the unit and the base or floor on which same should be set. This base should be solid and dimensioned in accordance with the weight to be supported. To fasten the supports to the base of the chassis, 8/10Ma screws are used. The antivibratory supports accessory includes 4 parts. These supports should be distributed amongst and fastened in the drilled holes in the base, the location of which is detailed in the General Dimensions section.

**YLCA/YLHA PLUS 5 ÷ 15**




**YLCA/YLHA PLUS 20 ÷ 27**



## Physical data, cool only units

| Characteristics | | YLCA-5 M and MC | YLCA-7 M and MC | YLCA-9 M and MC | YLCA-7 T and TC | YLCA-9 T and TC | YLCA-12 T and TC | YLCA-15 T and TC | YLCA-20 T and TC | YLCA-27 T and TC |
|---|---|---|---|---|---|---|---|---|---|---|
| Cooling capacity | kW | 5.38 | 7.13 | 8.63 | 7.13 | 8.63 | 12.4 | 14.50 | 19.52 | 25.6 |
| Power supply | V/ph | 230.1.50 | | | 400.3.50 | | | | | |
| Compressor consumption | kW | 1.73 | 2.41 | 3.40 | 2.41 | 3.16 | 3.80 | 5.38 | 6.57 | 8.73 |
| Compressor amperage | A | 7.8 | 11.7 | 17 | 3.9 | 5.7 | 6.36 | 8.9 | 13 | 16.7 |
| EER | | 2.87 | 2.76 | 2.41 | 2.76 | 2.59 | 2.97 | 2.52 | 2.81 | 2.81 |
| No. of compressors | | 1 | | | | | | | | |
| Compressor type | | SCROLL | | | | | | | | |
| Oil charge | l | 1.1 | 1.25 | | | | 1.95 | 1.66 | 2.51 | 3.25 |
| Oil type | | POLYOL ESTER OIL | | | | | | | | |
| Evaporating unit type | | PLACAS | | | | | | | | |
| Nominal water flow | l/h | 925 | 1 225 | 1 430 | 1 225 | 1 475 | 2 065 | 2 530 | 3 360 | 4 405 |
| Min. water volume of inst. (1) | l | 15 | 20 | 25 | 20 | 25 | 35 | 45 | 55 | 75 |
| No. of fans | | 1 | | | | | 2 | | | |
| Fan diameter | mm | 450 | | | | | | | | 560 |
| Fan consumption | W | 140 | 170 | | | | 2 x 185 | | | 2 x 175 |
| Fan amperage | A | 0.6 | 0.8 | | | | 2 x 0.87 | | | 2 x 0.85 |
| Total air flow | $m^3/h$ | 2 900 | 3 150 | | | | 6 150 | | 6 300 | 7 200 |
| Refrigerant type | | R-410A | | | | | | | | |
| Refrigerant charge | kg | 2.08 | 2.55 | 2.25 | 2.55 | 2.15 | 3.17 | 3.10 | 5 | 7.8 |
| Sound power | dB (A) | 70 | 70 | 71 | 70 | 71 | 73 | 73 | 74 | 78 |
| Sound pressure at 5 m. / 5 m. | dB (A) | 44 | 44 | 45 | 44 | 45 | 47 | 47 | 48 | 51 |
| Sound pressure at 10 m. /10 m. | dB (A) | 40 | 40 | 41 | 40 | 41 | 43 | 43 | 44 | 48 |
| **Dimensions** | | | | | | | | | | |
| Length | mm | 905 | | | | | | | 1 430 | 1 876 |
| Width | mm | 460 | | | | | | | 502 | |
| Height | mm | 762 | 965 | | | | 1 270 | | | |
| Water connections. female | | 1" | | | | | | | 1 1/4" | |
| Water filter | | 1" | | | | | 1 1/4" | | | |
| No. of pumps | | 1 | | | | | | | | |
| Available static pressure at nominal flow (without filter) (2) | kPa | 51 | 80 | 78 | 80 | 75 | 115 | 152 | 134 | 191 |
| Available static pressure at nominal flow (with filter) (3) | kPa | 49 | 75.5 | 71 | 75.5 | 67.5 | 113 | 149 | 129.5 | 182 |
| Pump consumption | W | 160 | 210 | | | | 400 | 490 | 390 | 755 |
| Pump amperage | A | 0.65 | 0.95 | | | | 1.8 | 2.15 | 1.1 | 1.34 |
| Unit water content | l | 1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.5 | 2 | 2.8 | 3.2 |
| Expansion vessel volume | l | 1 | 2 | | | | 5 | | | 8 |
| Relief valve setting | Bar | 6 | | | | | | | | |
| Max. unit power supply consumption | kW | 2.57 | 3.61 | 4.36 | 3.61 | 4.36 | 5.68 | 8 | 9.17 | 12.09 |
| Max. unit current amperage | A | 11.75 | 17.1 | 23 | 7.6 | 8.25 | 11.6 | 15.8 | 18.1 | 23 |
| Start-up current (compressor) | A | 60 | 82 | 97 | 35 | 48 | 51 | 74 | 95 | 118 |
| Weight (4) (5) | kg | 75 | 99 | 100 | 99 | 100 | 146 | 160 | 220 | 290 |

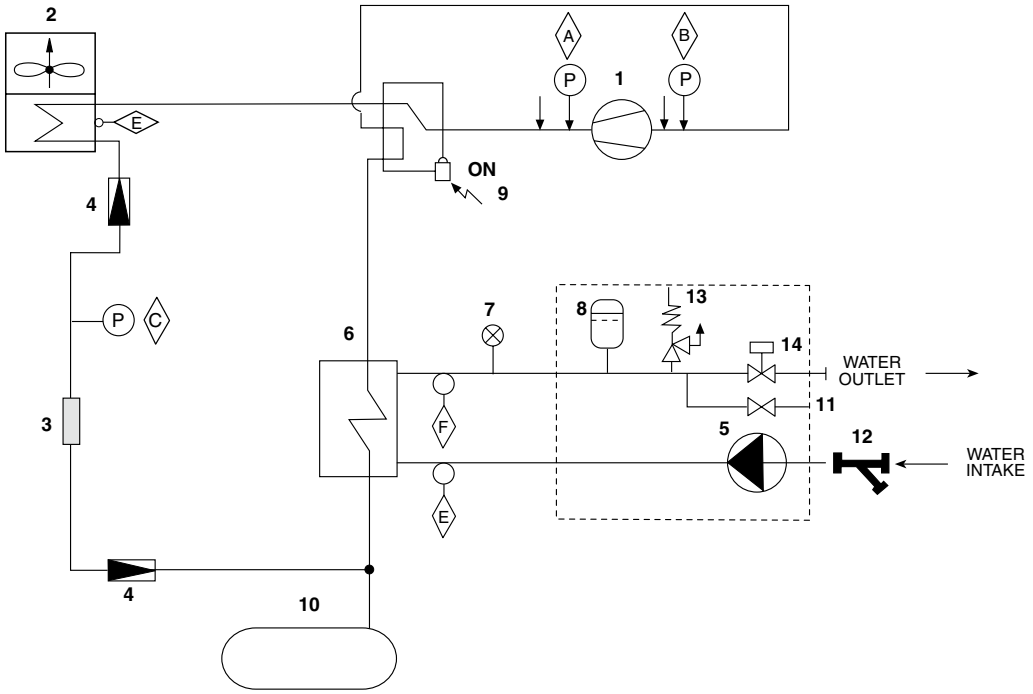
(1) On installations with lower volumes, and in a low charge situation, the "*suppress buffer tank*" function will activate automatically. Consequently, water temperature will lose precision in accordance with the decrease of the total water volume of the installation. Please consult before applying values lower to those indicated. (2) Available static pressure, Eurovent certified. (3) Pressure with clean filter. (4) Weight for empty unit.

## Physical data, heat pump units

| Characteristics | | YLHA PLUS-5 MC | YLHA PLUS-7 MC | YLHA PLUS-9 MC | YLHA PLUS-12 MC | YLHA PLUS-9 TC | YLHA PLUS-12 TC | YLHA PLUS-15 TC | YLHA PLUS-20 TC | YLHA PLUS-27 TC |
|---|---|---|---|---|---|---|---|---|---|---|
| Cooling capacity | kW | 5.4 | 7.10 | 8.7 | 11.75 | 8.7 | 12 | 13.8 | 19.4 | 25.8 |
| Heating capacity | kW | 6.3 | 7.16 | 9.52 | 12.25 | 9.52 | 12.4 | 16.1 | 20.9 | 27.5 |
| Power supply | V/ph/Hz | 230.1.50 | | | | 400.3.50 | | | | |
| Comp. consumption in cooling | kW | 1.77 | 2.41 | 3.29 | 3.90 | 3.29 | 3.80 | 5.13 | 6.71 | 8.47 |
| Comp. consumption in heating | kW | 1.76 | 2.30 | 2.98 | 3.55 | 2.98 | 3.77 | 4.81 | 6.06 | 7.89 |
| Comp. amperage in cooling | A | 8.4 | 11.7 | 16.3 | 20.2 | 6 | 6.36 | 8.7 | 11.7 | 15.1 |
| Comp. amperage in heating | A | 8.1 | 11.2 | 14.8 | 18.7 | 5.8 | 6.38 | 8.2 | 10.8 | 14.3 |
| EER/COP nominal conditions | | 2.82/3.32 | 2.75/2.90 | 2.51/3.02 | 2.75/3.12 | 2.51/3.02 | 2.88/3 | 2.52/3.12 | 2.75/3.25 | 2.90/3.30 |
| COP air 7/6 - water 30/35 | | 3.78 | 3.48 | 3.88 | 4.01 | 3.88 | 3.86 | 4 | 3.96 | 4.03 |
| No. of compressors | | 1 | | | | | | | | |
| Compressor type | | SCROLL | | | | | | | | |
| Oil charge in litres | l | 1.1 | 1.25 | | 1.24 | 1.25 | 1.24 | 1.89 | 2.51 | 3.25 |
| Oil type | | POLYOL ESTER OIL | | | | | | | | |
| Evaporating unit type | | PLATES | | | | | | | | |
| Nominal flow | l/h | 930 | 1 220 | 1 495 | 2 020 | 1 495 | 1 980 | 2 375 | 3 335 | 4 440 |
| Min. water volume of installation (1) | l | 15 | 20 | 25 | 35 | 25 | 35 | 45 | 55 | 75 |
| No. of fans | | 1 | | | 2 | 1 | 2 | | | |
| Fan diameter | mm | 450 | | | | | | | | 560 |
| Total fan consumption | W | 140 | 170 | | 2 x 185 | 170 | 2 x 185 | | 2 x 180 | 2 x 200 |
| Total fan amperage | A | 0.6 | 0.8 | | 2 x 0.87 | 0.8 | 2 x 0.87 | | | 2 x 1.30 |
| Total air flow | $m^3/h$ | 2 900 | 3 150 | | | | 6 150 | | 6 300 | 7 200 |
| Refrigerant type | | R-410A | | | | | | | | |
| Refrigerant charge | kg | 1.86 | 2.55 | 2.35 | 3.14 | 2.35 | 3.50 | 3.40 | 5.80 | 8.20 |
| Sound power | dB (A) | 70 | 70 | 71 | 73 | 71 | 73 | 73 | 74 | 78 |
| Sound pressure at 5 m. | dB (A) | 44 | 44 | 45 | 47 | 45 | 47 | 47 | 48 | 51 |
| Sound pressure at 10 m. | dB (A) | 40 | 40 | 41 | 43 | 41 | 43 | 43 | 44 | 48 |
| **Dimensions** | | | | | | | | | | |
| Length | mm | 905 | | | | | | | 1 430 | 1 876 |
| Width | mm | 460 | | | | | | | 502 | |
| Height | mm | 762 | 965 | | 1 270 | 965 | 1 270 | | | |
| Water connections, female | | 1" | | | | | | | 1 1/4" | |
| Water filter, female | | 1" | | | | | 1 1/4" | | | |
| No. of pumps | | 1 | | | | | | | | |
| Available static pressure at nominal flow (without filter) (2) | kPa | 51 | 80 | 75 | 116 | 75 | 118 | 160 | 130 | 191 |
| Available static pressure at nominal flow (with filter) (3) | kPa | 49 | 76 | 67.5 | 100 | 67.5 | 116 | 157.5 | 124 | 182 |
| Pump amperage | W | 160 | 210 | | 400 | 210 | 400 | 490 | 390 | 755 |
| Pump consumption | A | 0.65 | 0.95 | | 1.8 | 0.95 | 1.8 | 2.15 | 1.1 | 1.34 |
| Unit water content | l | 1 | 1.1 | 1.2 | 1.5 | 1.2 | 1.5 | 2 | 2.8 | 3.2 |
| Expansion vessel volume | l | 1 | 2 | | 5 | 2 | 5 | | | 8 |
| Relief valve setting | Bar | 6 | | | | | | | | |
| Max. unit power supply consumption | kW | 2.57 | 3.48 | 4.79 | 5.51 | 4.79 | 5.68 | 7.6 | 8.70 | 12.09 |
| Max. unit current amperage | A | 11.75 | 16.4 | 23 | 25.7 | 5.5 | 11.6 | 12.4 | 15.5 | 21 |
| Start-up current (compressor) | A | 60 | 82 | 97 | 116 | 48 | 51 | 74 | 95 | 118 |
| Weight (4) | kg | 77 | 102 | 103 | 154 | 103 | 150 | 164 | 235 | 330 |

(1) On installations with lower volumes, and in low charge conditions, the "*suppress buffer tank*" function will activate automatically. Consequently, water temperature will lose precision in accordance with the decrease of the total water volume of the installation. Please consult before applying values lower to those indicated. (2) Available static pressure, Eurovent certified. (3) Pressure with clean filter. (4) Weight for empty unit.

## Operation, cooling and hydraulic diagram, heat pump unit YLHA PLUS 5 to 15




SAFETY/CONTROL DEVICES

- **A** High pressure switch
- **B** Low pressure switch
- **C** Pressure transducer port
- **E** Condensing unit temp. sensor (fan speed setting, defrosts and display)
- **F** Water outlet temperature sensor (antifreeze and display)
- **G** Water intake temperature sensor (Setting and display)

COMPONENTS

- **1** Compressor
- **2** Air cooled condenser
- **3** Filter dryer
- **4** Expansion valve
- **5** Water pump
- **6** Plate heat exchanger
- **7** Automatic air bleed
- **8** Expansion vessel
- **9** Four-way valve
- **10** Liquid receiver
- **11** Drain connection
- **12** Water filter (not inside the unit)
- **13** Relief valve
- **14** Flow switch

→ Pipe connection with Schrader valve

----- For units with hydro kit only

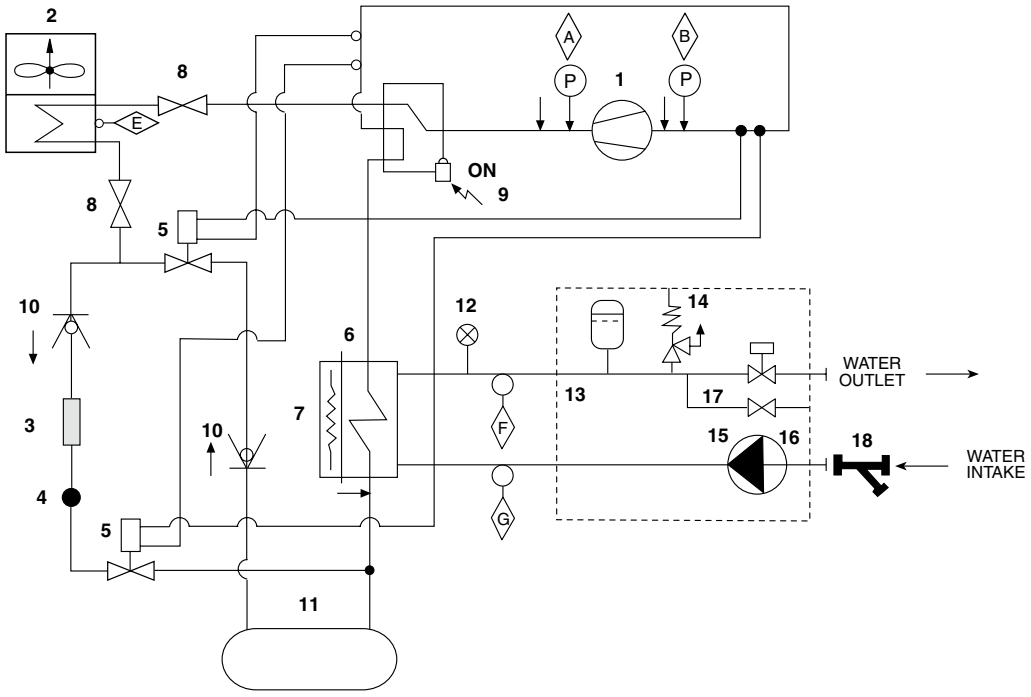
### Cooling cycle

The 4-way valve is activated. Heat exchange takes place between the heat transfer liquid (water or glycol water) and the refrigerant in the plate heat exchanger. Water is cooled, and refrigerant is evaporated and reheated. Then the Scroll type compressor condenses the refrigerant (gas) until the condensing pressure is reached, and the refrigerant goes to the air cooled condensing unit. In the air cooled condensing unit, heat is exchanged between the air and the refrigerant. The air is heated and evacuated from the chiller (heat rejection). The refrigerant is condensed and sub-cooled. Then the refrigerant (liquid) goes on to the expansion valve, where it is expanded until the evaporating pressure is reached, at which time it goes to the evaporating unit to start a new cooling cycle.

### Heating cycle

The cycle is reversed to heating mode. The 4-way valve is not activated. The condensing unit becomes the evaporating unit, and the evaporating unit becomes the condensing unit. The water in the heat exchanger is heated.

## Operation, cooling and hydraulic diagram, heat pump unit YLHA PLUS 20 and 27



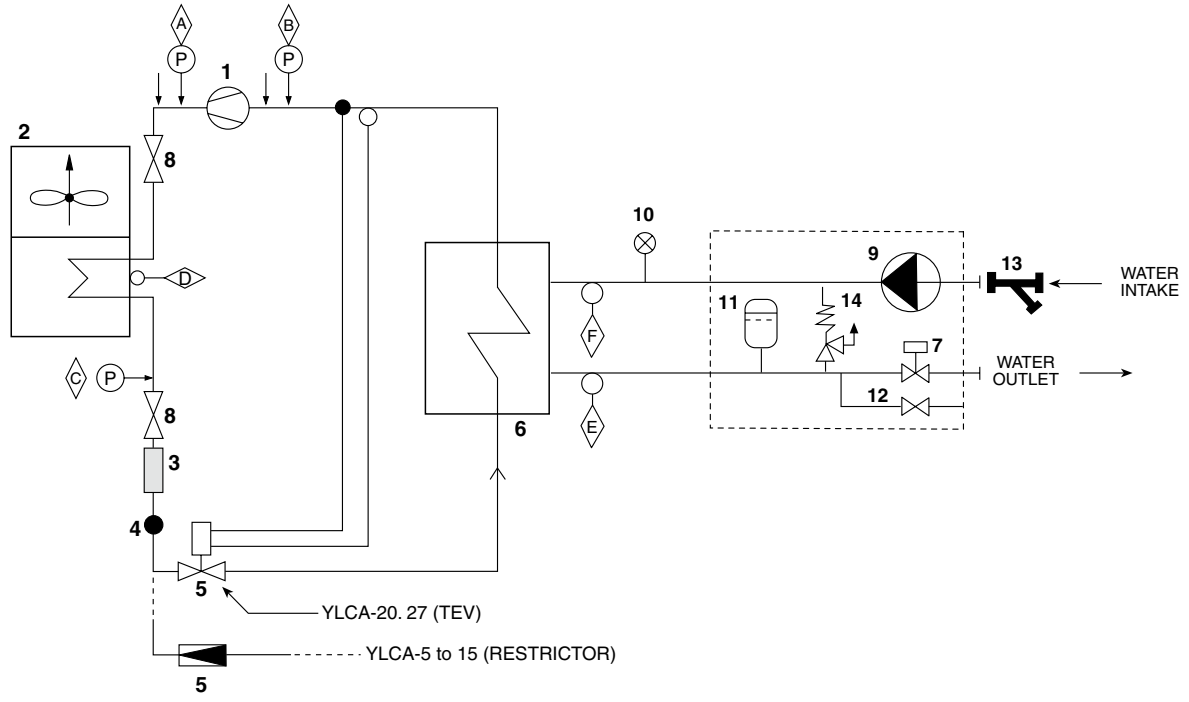

SAFETY/CONTROL DEVICES
- **A** High pressure switch
- **B** Low pressure switch
- **E** Condensing unit temperature sensors (fan speed setting and display)
- **F** Water outlet temperature sensor (antifreeze, setting and display)
- **G** Water intake temperature sensor (setting and display)

COMPONENTS
- **1** Tandem compressor
- **2** Air cooled condenser
- **3** Filter dryer
- **4** Liquid sight glass
- **5** Expansion valve
- **6** Heat exchanger
- **7** Exchanger antifreeze heater
- **8** Globe valve (20 and 27 only)
- **9** 4-way valve
- **10** Check valve
- **11** Liquid receiver
- **12** Automatic air bleed
- **13** Expansion vessel
- **14** Relief valve
- **15** Water pump
- **16** Flow switch
- **17** Drain connection
- **18** Water filter (not inside the unit)

→ Pipe connection with Schrader valve

----- For units with hydro kit only

## Operation, cooling and hydraulic diagram, cool only unit YLCA




SAFETY/CONTROL DEVICES

**A** High pressure switch

**B** Low pressure switch

**C** Pressure transducer port (LAK YLCA 5 to 15)
Pressure sensor. Pressure reading. Fan speed setting (YLCA 20, 27)

**D** Coil temperature sensor. Temperature reading and fan speed setting (YLCA 5 to 15)

**E** Water outlet temperature sensor (antifreeze and display)

**F** Water intake temperature sensor (Setting and display)

COMPONENTS

**1** Compressor

**2** Air cooled condenser

**3** Filter dryer

**4** Sight glass (YLCA 20, 27)

**5** Expansion valve

**6** Plate heat exchanger

**7** Flow switch

**8** Globe valve (YLCA 27)

**9** Water pump

**10** Automatic air bleed

**11** Expansion vessel

**12** Drain connection

**13** Water filter (not inside the unit)

**14** Relief valve

→ Pipe connection with Schrader valve

----- For units with hydro kit only

Heat exchange takes place between the heat transfer liquid (water or glycol water) and the refrigerant in the plate heat exchanger. Water is cooled, and refrigerant is evaporated and reheated. Then the Scroll compressor condenses the refrigerant (gas) until the condensing pressure is reached, and the refrigerant goes to the air cooled condensing unit. In the air cooled condensing unit, heat is exchanged between the air and the refrigerant. The air is heated and evacuated from the chiller (heat rejection).

The refrigerant is condensed and sub-cooled. Then the refrigerant (liquid) goes on to the expansion valve, where it is expanded until the evaporating pressure is reached, at which time it goes to the evaporating unit to start a new cooling cycle.

## Table 1. Cooling capacities YLCA 5 to 27

| Model YLCA | Water outlet temp. °C | Outdoor ambient temperature °C DB (80% RH) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20 | | 25 | | 30 | | 32 | | 35 | | 40 | | 43 | | 46 | |
| | | Cap. kW | Unit kW | Cap. kW | Unit kW | Cap. kW | Unit kW | Cap. kW | Unit kW | Cap. kW | Unit kW | Cap. kW | Unit kW | Cap. kW | Unit kW | Cap. kW | Unit kW |
| 5 | 5 | 5.71 | 1.59 | 5.55 | 1.63 | 5.31 | 1.70 | 5.18 | 1.76 | 4.99 | 1.85 | 4.41 | 2.06 | 4.18 | 2.18 | 3.92 | 2.33 |
| | 6 | 5.93 | 1.59 | 5.76 | 1.64 | 5.52 | 1.71 | 5.38 | 1.77 | 5.18 | 1.86 | 4.68 | 2.07 | 4.43 | 2.21 | 4.18 | 2.35 |
| | 7 | 6.15 | 1.60 | 5.98 | 1.65 | 5.73 | 1.72 | 5.59 | 1.77 | 5.38 | 1.87 | 4.95 | 2.08 | 4.69 | 2.23 | 4.44 | 2.38 |
| | 8 | 6.31 | 1.60 | 6.14 | 1.65 | 5.89 | 1.73 | 5.74 | 1.78 | 5.53 | 1.88 | 5.11 | 2.09 | 4.84 | 2.24 | 4.58 | 2.39 |
| | 10 | 6.65 | 1.61 | 6.48 | 1.66 | 6.21 | 1.74 | 6.06 | 1.79 | 5.83 | 1.89 | 5.44 | 2.10 | 5.15 | 2.25 | 4.88 | 2.40 |
| | 12 | 6.99 | 1.61 | 6.82 | 1.66 | 6.54 | 1.74 | 6.38 | 1.79 | 6.14 | 1.89 | 5.76 | 2.11 | 5.46 | 2.26 | 5.17 | 2.41 |
| | 15 | 7.50 | 1.62 | 7.33 | 1.67 | 7.03 | 1.75 | 6.86 | 1.80 | 6.60 | 1.90 | 6.26 | 2.12 | 5.93 | 2.26 | 5.62 | 2.42 |
| 7 | 5 | 7.11 | 2.18 | 6.99 | 2.24 | 6.69 | 2.32 | 6.66 | 2.40 | 6.28 | 2.53 | 5.49 | 2.86 | 5.21 | 3.04 | 4.78 | 3.27 |
| | 6 | 7.39 | 2.18 | 7.25 | 2.24 | 6.95 | 2.33 | 6.92 | 2.41 | 6.52 | 2.54 | 5.83 | 2.87 | 5.52 | 3.07 | 5.10 | 3.29 |
| | 7 | 7.58 | 2.19 | 7.50 | 2.27 | 7.22 | 2.35 | 7.19 | 2.42 | 7.13 | 2.58 | 6.17 | 2.88 | 5.84 | 3.11 | 5.41 | 3.33 |
| | 8 | 7.86 | 2.19 | 7.73 | 2.27 | 7.42 | 2.36 | 7.38 | 2.44 | 7.29 | 2.59 | 6.37 | 2.90 | 6.03 | 3.12 | 5.58 | 3.36 |
| | 10 | 8.28 | 2.20 | 8.16 | 2.27 | 7.82 | 2.37 | 7.79 | 2.45 | 7.45 | 2.60 | 6.78 | 2.91 | 6.42 | 3.14 | 5.95 | 3.37 |
| | 12 | 8.71 | 2.20 | 8.59 | 2.28 | 8.23 | 2.37 | 8.20 | 2.45 | 7.73 | 2.61 | 7.18 | 2.92 | 6.80 | 3.15 | 6.30 | 3.39 |
| | 15 | 9.34 | 2.22 | 9.23 | 2.28 | 8.85 | 2.38 | 8.82 | 2.46 | 8.31 | 2.62 | 7.80 | 2.94 | 7.39 | 3.15 | 6.85 | 3.40 |
| 9 | 5 | 8.61 | 2.60 | 8.80 | 2.89 | 8.33 | 2.99 | 8.06 | 3.09 | 7.60 | 3.30 | 6.65 | 3.69 | 6.30 | 3.93 | 5.78 | 4.22 |
| | 6 | 8.94 | 2.61 | 9.13 | 2.90 | 8.66 | 3.01 | 8.37 | 3.11 | 7.89 | 3.31 | 7.06 | 3.71 | 6.68 | 3.94 | 6.17 | 4.24 |
| | 7 | 9.86 | 2.62 | 9.44 | 2.91 | 8.99 | 3.03 | 8.70 | 3.13 | 8.63 | 3.33 | 7.46 | 3.72 | 7.07 | 3.95 | 6.55 | 4.26 |
| | 8 | 9.51 | 2.63 | 9.73 | 2.92 | 9.24 | 3.04 | 8.93 | 3.15 | 8.81 | 3.35 | 7.71 | 3.73 | 7.30 | 3.96 | 6.76 | 4.28 |
| | 10 | 10.03 | 2.66 | 10.27 | 2.94 | 9.74 | 3.05 | 9.43 | 3.19 | 9.00 | 3.37 | 8.20 | 3.75 | 7.77 | 3.98 | 7.20 | 4.32 |
| | 12 | 10.54 | 2.68 | 10.81 | 2.96 | 10.26 | 3.06 | 9.93 | 3.23 | 9.36 | 3.39 | 8.69 | 3.77 | 8.23 | 4.00 | 7.63 | 4.36 |
| | 15 | 11.31 | 2.71 | 11.62 | 2.99 | 11.02 | 3.08 | 10.67 | 3.29 | 10.06 | 3.45 | 9.44 | 3.80 | 8.94 | 4.07 | 8.47 | 4.39 |
| 12 | 5 | 12.37 | 3.06 | 12.15 | 3.43 | 11.63 | 3.8 | 11.58 | 3.88 | 10.93 | 4.13 | 9.55 | 4.62 | 9.06 | 4.92 | 8.31 | 5.28 |
| | 6 | 12.85 | 3.08 | 12.61 | 3.45 | 12.09 | 3.82 | 12.03 | 3.9 | 11.34 | 4.15 | 10.14 | 4.64 | 9.6 | 4.97 | 8.86 | 5.30 |
| | 7 | 13.78 | 3.10 | 13.49 | 3.47 | 12.97 | 3.84 | 12.5 | 3.92 | 12.40 | 4.17 | 10.72 | 4.66 | 10.16 | 5.03 | 9.41 | 5.32 |
| | 8 | 14.03 | 3.12 | 13.82 | 3.49 | 13.15 | 3.86 | 12.83 | 3.94 | 12.65 | 4.19 | 11.07 | 4.68 | 10.49 | 5.05 | 9.71 | 5.34 |
| | 10 | 14.41 | 3.16 | 14.19 | 3.53 | 13.60 | 3.90 | 13.55 | 3.96 | 12.9 | 4.21 | 11.79 | 4.70 | 11.16 | 5.07 | 10.35 | 5.36 |
| | 12 | 15.14 | 3.20 | 14.93 | 3.57 | 14.32 | 3.92 | 14.26 | 3.96 | 13.44 | 4.22 | 12.48 | 4.73 | 11.83 | 5.09 | 10.96 | 5.38 |
| | 15 | 16.25 | 3.26 | 16.05 | 3.63 | 15.39 | 3.95 | 15.34 | 3.98 | 14.45 | 4.23 | 13.56 | 4.75 | 12.85 | 5.11 | 11.54 | 5.40 |
| 15 | 5 | 14.47 | 4.54 | 14.21 | 4.67 | 13.60 | 4.84 | 13.54 | 5.00 | 12.78 | 5.33 | 11.17 | 5.96 | 10.59 | 6.35 | 9.72 | 6.81 |
| | 6 | 15.02 | 4.56 | 14.75 | 4.69 | 14.13 | 4.86 | 14.07 | 5.03 | 13.26 | 5.35 | 11.86 | 5.99 | 11.22 | 6.41 | 10.36 | 6.87 |
| | 7 | 15.42 | 4.57 | 15.25 | 4.71 | 14.68 | 4.89 | 14.61 | 5.05 | 14.50 | 5.38 | 12.54 | 6.01 | 11.88 | 6.19 | 11.01 | 6.95 |
| | 8 | 15.99 | 4.59 | 15.72 | 4.72 | 15.08 | 4.92 | 15.01 | 5.08 | 14.16 | 5.41 | 12.95 | 6.04 | 12.26 | 6.52 | 11.36 | 7.01 |
| | 10 | 16.85 | 4.59 | 16.59 | 4.73 | 15.90 | 4.95 | 15.84 | 5.11 | 14.93 | 5.43 | 13.78 | 6.07 | 13.05 | 6.54 | 12.10 | 7.03 |
| | 12 | 17.71 | 4.61 | 17.46 | 4.75 | 16.75 | 4.97 | 16.68 | 5.11 | 15.72 | 5.44 | 14.59 | 6.10 | 13.83 | 6.57 | 12.82 | 7.06 |
| | 15 | 19.00 | 4.62 | 18.77 | 4.76 | 18.00 | 5.00 | 17.93 | 5.14 | 16.90 | 5.46 | 15.86 | 6.12 | 15.02 | 6.60 | 13.94 | 7.09 |
| 20 | 5 | 21.41 | 5.45 | 20.97 | 5.61 | 20.22 | 5.87 | 19.88 | 6.10 | 19.29 | 6.87 | 17.18 | 7.24 | 16.4 | 7.72 | 15.51 | 8.29 |
| | 6 | 22.39 | 5.48 | 21.93 | 5.67 | 21.02 | 5.93 | 20.58 | 6.16 | 19.40 | 6.90 | 18.9 | 7.30 | 17.24 | 7.82 | 16.31 | 8.38 |
| | 7 | 23.33 | 5.54 | 22.73 | 5.72 | 21.82 | 5.99 | 21.35 | 6.21 | 19.52 | 6.94 | 18.99 | 7.36 | 18.03 | 7.94 | 17.08 | 8.50 |
| | 8 | 24.05 | 5.57 | 23.40 | 5.75 | 22.45 | 6.05 | 21.88 | 6.27 | 21.00 | 6.98 | 18.44 | 7.41 | 18.40 | 8.00 | 17.37 | 8.59 |
| | 10 | 25.47 | 5.64 | 24.77 | 5.81 | 23.69 | 6.11 | 23.03 | 6.33 | 22.03 | 7.01 | 20.52 | 7.47 | 19.35 | 8.06 | 18.25 | 8.66 |
| | 12 | 26.97 | 5.65 | 26.17 | 5.85 | 24.95 | 6.14 | 24.18 | 6.36 | 23.09 | 7.01 | 21.54 | 7.54 | 20.28 | 8.11 | 19.05 | 8.72 |
| | 15 | 29.16 | 5.74 | 28.23 | 5.92 | 26.82 | 6.21 | 25.92 | 6.44 | 24.7 | 7.05 | 23.2 | 7.61 | 21.76 | 8.15 | 20.4 | 8.78 |
| 27 | 5 | 28.60 | 6.90 | 27.49 | 7.53 | 25.77 | 8.17 | 26.05 | 8.64 | 24.28 | 8.99 | 22.52 | 9.48 | 21.50 | 10.10 | 19.60 | 10.97 |
| | 6 | 30.03 | 7.00 | 28.61 | 7.58 | 26.81 | 8.24 | 26.98 | 8.71 | 24.94 | 9.03 | 23.72 | 9.55 | 22.60 | 10.23 | 21.38 | 11.02 |
| | 7 | 30.62 | 7.11 | 29.32 | 7.63 | 27.63 | 8.33 | 27.98 | 8.78 | 25.60 | 9.08 | 24.90 | 9.62 | 23.63 | 10.39 | 22.39 | 11.07 |
| | 8 | 32.21 | 7.22 | 30.68 | 7.76 | 28.69 | 8.53 | 28.68 | 8.86 | 27.52 | 9.18 | 25.48 | 9.70 | 24.11 | 10.46 | 22.77 | 11.12 |
| | 10 | 34.07 | 7.30 | 32.47 | 7.84 | 30.32 | 8.61 | 30.19 | 8.93 | 28.88 | 9.28 | 26.90 | 9.77 | 25.36 | 10.54 | 23.92 | 11.22 |
| | 12 | 36.04 | 7.42 | 34.30 | 7.89 | 31.97 | 8.65 | 31.69 | 8.98 | 30.27 | 9.43 | 28.23 | 9.86 | 26.58 | 10.62 | 24.97 | 11.32 |
| | 15 | 38.59 | 7.54 | 37.01 | 7.99 | 34.42 | 8.74 | 33.98 | 9.08 | 32.38 | 9.58 | 30.41 | 9.96 | 28.53 | 10.66 | 26.96 | 11.47 |

## Table 2. Cooling capacities YLCA 5 to 27 (35% ethylene glycol)

| Model YLCA | Water outlet temp. °C | Outdoor ambient temperature °C DB (80% RH) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20 | | 25 | | 30 | | 32 | | 35 | | 40 | | 43 | | 46 | |
| | | Cap. | Unit | Cap. | Unit | Cap. | Unit | Cap. | Unit | Cap. | Unit | Cap. | Unit | Cap. | Unit | Cap. | Unit |
| | | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW |
| 5 | -5 | 3.60 | 1.12 | 3.44 | 1.22 | 3.28 | 1.32 | 3.20 | 1.37 | 3.08 | 1.44 | 2.83 | 1.57 | 2.68 | 1.65 | 2.53 | 1.74 |
| | -4 | 3.79 | 1.15 | 3.63 | 1.24 | 3.44 | 1.35 | 3.36 | 1.40 | 3.23 | 1.47 | 2.97 | 1.61 | 2.81 | 1.69 | 2.64 | 1.80 |
| | -2 | 4.14 | 1.21 | 3.99 | 1.30 | 3.77 | 1.42 | 3.68 | 1.46 | 3.55 | 1.54 | 3.25 | 1.68 | 3.08 | 1.77 | 2.88 | 1.87 |
| | 0 | 4.49 | 1.26 | 4.36 | 1.36 | 4.14 | 1.48 | 4.03 | 1.53 | 3.88 | 1.61 | 3.56 | 1.76 | 3.36 | 1.85 | 3.12 | 1.94 |
| | 2 | 4.98 | 1.32 | 4.75 | 1.42 | 4.51 | 1.55 | 4.40 | 1.60 | 4.24 | 1.68 | 3.89 | 1.84 | 3.67 | 1.93 | 3.47 | 2.02 |
| | 4 | 5.33 | 1.37 | 5.14 | 1.48 | 4.88 | 1.61 | 4.77 | 1.67 | 4.59 | 1.75 | 4.21 | 1.92 | 3.99 | 2.01 | 3.77 | 2.13 |
| 7 | -5 | 4.49 | 1.53 | 4.34 | 1.66 | 4.13 | 1.81 | 4.12 | 1.87 | 3.88 | 1.96 | 3.52 | 2.18 | 3.34 | 2.30 | 3.08 | 2.44 |
| | -4 | 4.73 | 1.57 | 4.57 | 1.70 | 4.33 | 1.85 | 4.31 | 1.91 | 4.07 | 2.01 | 3.69 | 2.23 | 3.50 | 2.36 | 3.21 | 2.52 |
| | -2 | 5.16 | 1.65 | 5.02 | 1.78 | 4.75 | 1.94 | 4.73 | 2.00 | 4.47 | 2.10 | 4.05 | 2.33 | 3.83 | 2.47 | 3.51 | 2.62 |
| | 0 | 5.60 | 1.72 | 5.49 | 1.86 | 5.22 | 2.02 | 5.18 | 2.09 | 4.88 | 2.20 | 4.43 | 2.44 | 4.19 | 2.58 | 3.80 | 2.73 |
| | 2 | 6.20 | 1.80 | 5.98 | 1.94 | 5.68 | 2.11 | 5.65 | 2.18 | 5.33 | 2.30 | 4.84 | 2.55 | 4.58 | 2.69 | 4.23 | 2.83 |
| | 4 | 6.64 | 1.88 | 6.47 | 2.03 | 6.14 | 2.20 | 6.13 | 2.28 | 5.78 | 2.40 | 5.25 | 2.66 | 4.97 | 2.81 | 4.59 | 2.99 |
| 9 | -5 | 5.78 | 2.00 | 5.52 | 2.17 | 5.26 | 2.36 | 5.14 | 2.43 | 4.95 | 2.56 | 4.54 | 2.80 | 4.29 | 2.94 | 4.06 | 3.10 |
| | -4 | 6.08 | 2.05 | 5.82 | 2.22 | 5.51 | 2.41 | 5.38 | 2.49 | 5.19 | 2.62 | 4.76 | 2.87 | 4.50 | 3.01 | 4.23 | 3.20 |
| | -2 | 6.65 | 2.15 | 6.39 | 2.32 | 6.05 | 2.52 | 5.91 | 2.61 | 5.69 | 2.74 | 5.22 | 2.99 | 4.94 | 3.15 | 4.62 | 3.33 |
| | 0 | 7.21 | 2.25 | 6.99 | 2.42 | 6.65 | 2.64 | 6.46 | 2.73 | 6.22 | 2.87 | 5.71 | 3.13 | 5.40 | 3.30 | 5.01 | 3.46 |
| | 2 | 7.98 | 2.35 | 7.62 | 2.53 | 7.24 | 2.75 | 7.05 | 2.85 | 6.79 | 2.99 | 6.23 | 3.27 | 5.89 | 3.44 | 5.57 | 3.60 |
| | 4 | 8.54 | 2.45 | 8.24 | 2.64 | 7.83 | 2.87 | 7.65 | 2.97 | 7.37 | 3.12 | 6.76 | 3.41 | 6.39 | 3.59 | 6.04 | 3.80 |
| 12 | -5 | 8.31 | 2.50 | 7.94 | 2.71 | 7.56 | 2.95 | 7.38 | 3.05 | 7.11 | 3.21 | 6.52 | 3.50 | 6.17 | 3.68 | 5.83 | 3.88 |
| | -4 | 8.74 | 2.56 | 8.36 | 2.78 | 7.92 | 3.02 | 7.74 | 3.12 | 7.45 | 3.28 | 6.83 | 3.59 | 6.47 | 3.77 | 6.08 | 4.00 |
| | -2 | 9.55 | 2.69 | 9.19 | 2.90 | 8.69 | 3.16 | 8.49 | 3.27 | 8.18 | 3.43 | 7.50 | 3.75 | 7.09 | 3.95 | 6.63 | 4.17 |
| | 0 | 10.35 | 2.81 | 10.05 | 3.03 | 9.55 | 3.30 | 9.28 | 3.41 | 8.94 | 3.59 | 8.20 | 3.92 | 7.75 | 4.13 | 7.19 | 4.34 |
| | 2 | 11.47 | 2.94 | 10.94 | 3.17 | 10.40 | 3.45 | 10.13 | 3.56 | 9.76 | 3.75 | 8.96 | 4.10 | 8.47 | 4.31 | 8.00 | 4.50 |
| | 4 | 12.28 | 3.06 | 11.84 | 3.31 | 11.25 | 3.60 | 10.99 | 3.71 | 10.59 | 3.91 | 9.71 | 4.28 | 9.19 | 4.49 | 8.68 | 4.75 |
| 15 | -5 | 9.72 | 3.23 | 9.28 | 3.50 | 8.84 | 3.81 | 8.63 | 3.93 | 8.31 | 4.14 | 7.63 | 4.52 | 7.22 | 4.75 | 6.82 | 5.00 |
| | -4 | 10.22 | 3.31 | 9.77 | 3.58 | 9.26 | 3.90 | 9.05 | 4.02 | 8.71 | 4.23 | 7.99 | 4.63 | 7.56 | 4.86 | 7.11 | 5.16 |
| | -2 | 11.17 | 3.47 | 10.74 | 3.74 | 10.16 | 4.08 | 9.92 | 4.21 | 9.56 | 4.43 | 8.77 | 4.84 | 8.29 | 5.09 | 7.76 | 5.38 |
| | 0 | 12.11 | 3.63 | 11.75 | 3.92 | 11.17 | 4.26 | 10.85 | 4.40 | 10.45 | 4.63 | 9.59 | 5.06 | 9.06 | 5.33 | 8.41 | 5.60 |
| | 2 | 13.41 | 3.79 | 12.80 | 4.09 | 12.16 | 4.45 | 11.85 | 4.60 | 11.42 | 4.84 | 10.47 | 5.29 | 9.90 | 5.56 | 9.35 | 5.81 |
| | 4 | 14.36 | 3.95 | 13.85 | 4.27 | 13.15 | 4.64 | 12.85 | 4.79 | 12.38 | 5.05 | 11.36 | 5.52 | 10.74 | 5.80 | 10.15 | 6.13 |
| 20 | -5 | 13.61 | 3.86 | 13.05 | 4.20 | 12.48 | 4.60 | 12.25 | 4.77 | 11.74 | 5.34 | 10.94 | 5.54 | 10.42 | 5.85 | 9.87 | 6.21 |
| | -4 | 14.39 | 3.98 | 13.78 | 4.31 | 13.08 | 4.73 | 12.82 | 4.89 | 11.87 | 5.46 | 11.38 | 5.69 | 10.79 | 6.01 | 10.14 | 6.42 |
| | -2 | 15.79 | 4.19 | 15.19 | 4.53 | 14.37 | 4.97 | 14.03 | 5.15 | 13.47 | 5.72 | 12.38 | 5.97 | 11.70 | 6.31 | 10.92 | 6.71 |
| | 0 | 17.2 | 4.41 | 16.66 | 4.76 | 15.81 | 5.21 | 15.3 | 5.40 | 14.65 | 5.97 | 13.42 | 6.26 | 12.64 | 6.62 | 11.67 | 7.00 |
| | 2 | 19.2 | 4.62 | 18.22 | 5.01 | 17.21 | 5.47 | 16.66 | 5.67 | 15.93 | 6.24 | 14.53 | 6.57 | 13.65 | 6.94 | 12.79 | 7.29 |
| | 4 | 20.71 | 4.86 | 19.79 | 5.26 | 18.62 | 5.74 | 18.02 | 5.95 | 17.2 | 6.51 | 15.62 | 6.89 | 14.63 | 7.26 | 13.67 | 7.72 |
| 27 | -5 | 17.84 | 5.05 | 17.10 | 5.50 | 16.36 | 6.01 | 16.06 | 6.24 | 15.56 | 6.98 | 14.34 | 7.25 | 13.66 | 7.66 | 12.93 | 8.12 |
| | -4 | 18.86 | 5.20 | 18.07 | 5.64 | 17.15 | 6.18 | 16.80 | 6.40 | 16.61 | 7.14 | 14.91 | 7.45 | 14.14 | 7.87 | 13.30 | 8.40 |
| | -2 | 20.70 | 5.49 | 19.92 | 5.93 | 18.83 | 6.50 | 18.40 | 6.73 | 17.66 | 7.48 | 16.23 | 7.81 | 15.33 | 8.26 | 14.31 | 8.78 |
| | 0 | 22.55 | 5.77 | 21.84 | 6.23 | 20.72 | 6.81 | 20.06 | 7.07 | 19.21 | 7.81 | 17.60 | 8.20 | 16.56 | 8.66 | 15.29 | 9.16 |
| | 2 | 25.17 | 6.05 | 23.88 | 6.55 | 22.56 | 7.16 | 21.84 | 7.42 | 20.88 | 8.16 | 19.05 | 8.60 | 17.89 | 9.08 | 16.76 | 9.54 |
| | 4 | 27.14 | 6.36 | 25.94 | 6.89 | 24.41 | 7.51 | 23.62 | 7.78 | 22.54 | 8.52 | 20.47 | 9.01 | 19.18 | 9.50 | 17.92 | 10.10 |

## Table 3. Cooling capacities YLHA PLUS 5 to 27

| Model YLHA PLUS | Water outlet temp. °C | Outdoor ambient temperature °C DB (80% RH) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20 | | 25 | | 30 | | 32 | | 35 | | 40 | | 43 | | 46 | |
| | | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power |
| | | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW |
| 5 M | 5 | 6.00 | 1.50 | 5.70 | 1.58 | 5.25 | 1.70 | 5.10 | 1.80 | 5.06 | 1.90 | 4.49 | 2.10 | 4.22 | 2.23 | 3.88 | 2.50 |
| | 6 | 6.25 | 1.50 | 5.80 | 1.59 | 5.45 | 1.71 | 5.29 | 1.81 | 5.23 | 1.90 | 4.77 | 2.11 | 4.47 | 2.23 | 4.07 | 2.50 |
| | 7 | 6.50 | 1.51 | 5.90 | 1.60 | 5.60 | 1.72 | 5.48 | 1.81 | 5.40 | 1.91 | 5.06 | 2.12 | 4.72 | 2.24 | 4.22 | 2.51 |
| | 8 | 6.60 | 1.51 | 6.00 | 1.61 | 5.67 | 1.73 | 5.59 | 1.82 | 5.55 | 1.92 | 5.21 | 2.13 | 4.87 | 2.26 | 4.41 | 2.51 |
| | 10 | 6.70 | 1.51 | 6.20 | 1.61 | 5.86 | 1.75 | 5.70 | 1.84 | 5.70 | 1.95 | 5.36 | 2.16 | 5.10 | 2.29 | 4.64 | 2.52 |
| | 12 | 6.80 | 1.52 | 6.40 | 1.62 | 6.01 | 1.76 | 5.86 | 1.85 | 5.82 | 1.97 | 5.51 | 2.19 | 5.32 | 2.32 | 4.98 | 2.52 |
| | 15 | 7.00 | 1.52 | 6.70 | 1.63 | 6.24 | 1.78 | 6.08 | 1.87 | 5.97 | 2.00 | 5.70 | 2.22 | 5.59 | 2.37 | 5.30 | 2.53 |
| 7 M | 5 | 7.60 | 2.06 | 7.30 | 2.14 | 6.90 | 2.30 | 6.70 | 2.43 | 6.65 | 2.56 | 5.90 | 2.84 | 5.55 | 3.01 | 5.10 | 3.20 |
| | 6 | 7.75 | 2.07 | 7.45 | 2.15 | 7.10 | 2.31 | 6.95 | 2.44 | 6.88 | 2.57 | 6.28 | 2.85 | 5.88 | 3.02 | 5.35 | 3.24 |
| | 7 | 7.90 | 2.07 | 7.60 | 2.16 | 7.30 | 2.32 | 7.20 | 2.45 | 7.10 | 2.58 | 6.65 | 2.86 | 6.20 | 3.03 | 5.55 | 3.28 |
| | 8 | 8.05 | 2.08 | 7.75 | 2.17 | 7.45 | 2.34 | 7.35 | 2.46 | 7.30 | 2.60 | 6.85 | 2.88 | 6.40 | 3.05 | 5.80 | 3.32 |
| | 10 | 8.30 | 2.08 | 7.90 | 2.18 | 7.70 | 2.36 | 7.50 | 2.48 | 7.50 | 2.63 | 7.05 | 2.92 | 6.70 | 3.09 | 6.10 | 3.38 |
| | 12 | 8.55 | 2.09 | 8.20 | 2.19 | 7.90 | 2.38 | 7.70 | 2.50 | 7.65 | 2.66 | 7.25 | 2.96 | 7.00 | 3.14 | 6.55 | 3.42 |
| | 15 | 8.90 | 2.09 | 8.50 | 2.20 | 8.20 | 2.40 | 8.00 | 2.53 | 7.85 | 2.70 | 7.50 | 3.00 | 7.35 | 3.20 | 6.97 | 3.48 |
| 9 M | 5 | 9.31 | 2.76 | 8.95 | 2.87 | 8.45 | 3.08 | 8.21 | 3.26 | 8.15 | 3.43 | 7.23 | 3.81 | 6.80 | 4.04 | 6.25 | 4.29 |
| | 6 | 9.50 | 2.78 | 9.13 | 2.88 | 8.70 | 3.10 | 8.52 | 3.27 | 8.42 | 3.45 | 7.69 | 3.82 | 7.20 | 4.04 | 6.56 | 4.35 |
| | 7 | 9.68 | 2.78 | 9.31 | 2.90 | 8.95 | 3.11 | 8.82 | 3.29 | 8.70 | 3.46 | 8.15 | 3.84 | 7.60 | 4.06 | 6.80 | 4.40 |
| | 8 | 9.86 | 2.79 | 9.50 | 2.91 | 9.13 | 3.14 | 9.01 | 3.30 | 8.95 | 3.49 | 8.39 | 3.86 | 7.84 | 4.09 | 7.11 | 4.45 |
| | 10 | 10.17 | 2.79 | 9.68 | 2.92 | 9.44 | 3.16 | 9.19 | 3.33 | 9.19 | 3.53 | 8.64 | 3.92 | 8.21 | 4.14 | 7.47 | 4.53 |
| | 12 | 10.48 | 2.80 | 10.05 | 2.94 | 9.68 | 3.19 | 9.44 | 3.35 | 9.37 | 3.57 | 8.88 | 3.97 | 8.58 | 4.21 | 8.03 | 4.59 |
| | 15 | 10.91 | 2.80 | 10.42 | 2.95 | 10.05 | 3.22 | 9.80 | 3.39 | 9.62 | 3.62 | 9.19 | 4.02 | 9.01 | 4.29 | 8.54 | 4.67 |
| 9 T | 5 | 9.31 | 2.76 | 8.95 | 2.87 | 8.45 | 3.08 | 8.21 | 3.26 | 8.15 | 3.43 | 7.23 | 3.81 | 6.80 | 4.04 | 6.25 | 4.29 |
| | 6 | 9.50 | 2.78 | 9.13 | 2.88 | 8.70 | 3.10 | 8.52 | 3.27 | 8.42 | 3.45 | 7.69 | 3.82 | 7.20 | 4.04 | 6.56 | 4.35 |
| | 7 | 9.68 | 2.78 | 9.31 | 2.90 | 8.95 | 3.11 | 8.82 | 3.29 | 8.70 | 3.46 | 8.15 | 3.84 | 7.60 | 4.06 | 6.80 | 4.40 |
| | 8 | 9.86 | 2.79 | 9.50 | 2.91 | 9.13 | 3.14 | 9.01 | 3.30 | 8.95 | 3.49 | 8.39 | 3.86 | 7.84 | 4.09 | 7.11 | 4.45 |
| | 10 | 10.17 | 2.79 | 9.68 | 2.92 | 9.44 | 3.16 | 9.19 | 3.33 | 9.19 | 3.53 | 8.64 | 3.92 | 8.21 | 4.14 | 7.47 | 4.53 |
| | 12 | 10.48 | 2.80 | 10.05 | 2.94 | 9.68 | 3.19 | 9.44 | 3.35 | 9.37 | 3.57 | 8.88 | 3.97 | 8.58 | 4.21 | 8.03 | 4.59 |
| | 15 | 10.91 | 2.80 | 10.42 | 2.95 | 10.05 | 3.22 | 9.80 | 3.39 | 9.62 | 3.62 | 9.19 | 4.02 | 9.01 | 4.29 | 8.54 | 4.67 |
| 12 M | 5 | 12.63 | 3.36 | 12.08 | 3.48 | 11.60 | 3.81 | 11.09 | 4.02 | 11.01 | 4.24 | 9.76 | 4.70 | 9.18 | 4.98 | 8.60 | 5.28 |
| | 6 | 12.90 | 3.37 | 12.33 | 3.50 | 11.90 | 3.82 | 11.50 | 4.04 | 11.38 | 4.25 | 10.38 | 4.71 | 9.72 | 4.99 | 8.85 | 5.32 |
| | 7 | 13.40 | 3.39 | 12.99 | 3.52 | 12.43 | 3.84 | 11.92 | 4.05 | 11.75 | 4.27 | 11.01 | 4.73 | 10.26 | 5.01 | 9.18 | 5.34 |
| | 8 | 13.55 | 3.44 | 12.83 | 3.59 | 12.55 | 3.87 | 12.16 | 4.07 | 12.08 | 4.30 | 11.34 | 4.77 | 10.59 | 5.05 | 9.60 | 5.36 |
| | 10 | 13.74 | 3.44 | 13.07 | 3.61 | 12.74 | 3.91 | 12.41 | 4.10 | 12.41 | 4.35 | 11.67 | 4.83 | 11.09 | 5.11 | 10.10 | 5.40 |
| | 12 | 14.15 | 3.46 | 13.57 | 3.62 | 13.07 | 3.94 | 12.74 | 4.14 | 12.66 | 4.40 | 12.00 | 4.90 | 11.58 | 5.20 | 10.84 | 5.44 |
| | 15 | 14.73 | 3.46 | 14.07 | 3.64 | 13.57 | 3.97 | 13.24 | 4.19 | 12.99 | 4.47 | 12.41 | 4.97 | 12.16 | 5.30 | 11.53 | 5.52 |
| 12 T | 5 | 12.9 | 3.27 | 12.34 | 3.39 | 11.85 | 3.71 | 11.32 | 3.92 | 11.24 | 4.13 | 9.97 | 4.58 | 9.38 | 4.85 | 8.78 | 5.14 |
| | 6 | 13.17 | 3.28 | 12.59 | 3.41 | 12.15 | 3.72 | 11.75 | 3.93 | 11.62 | 4.14 | 10.61 | 4.59 | 9.93 | 4.86 | 9.04 | 5.18 |
| | 7 | 13.69 | 3.30 | 13.27 | 3.43 | 12.69 | 3.74 | 12.17 | 3.95 | 12.00 | 4.16 | 11.24 | 4.61 | 10.48 | 4.89 | 9.38 | 5.20 |
| | 8 | 13.84 | 3.35 | 13.10 | 3.50 | 12.82 | 3.77 | 12.42 | 3.97 | 12.34 | 4.19 | 11.58 | 4.64 | 10.82 | 4.92 | 9.80 | 5.22 |
| | 10 | 14.03 | 3.35 | 13.35 | 3.52 | 13.01 | 3.81 | 12.68 | 4.00 | 12.68 | 4.24 | 11.92 | 4.71 | 11.32 | 4.98 | 10.31 | 5.26 |
| | 12 | 14.45 | 3.37 | 13.86 | 3.53 | 13.35 | 3.84 | 13.01 | 4.03 | 12.93 | 4.29 | 12.25 | 4.77 | 11.83 | 5.06 | 11.07 | 5.30 |
| | 15 | 15.04 | 3.37 | 14.37 | 3.55 | 13.86 | 3.87 | 13.52 | 4.08 | 13.27 | 4.35 | 12.68 | 4.84 | 12.42 | 5.16 | 11.78 | 5.38 |
| 15 T | 5 | 14.83 | 4.30 | 14.19 | 4.46 | 13.62 | 4.88 | 13.02 | 5.15 | 12.93 | 5.43 | 11.47 | 6.02 | 10.79 | 6.38 | 10.10 | 6.76 |
| | 6 | 15.15 | 4.32 | 14.48 | 4.48 | 13.98 | 4.90 | 13.51 | 5.17 | 13.36 | 5.45 | 12.20 | 6.03 | 11.42 | 6.39 | 10.40 | 6.82 |
| | 7 | 15.74 | 4.34 | 15.26 | 4.51 | 14.60 | 4.92 | 13.99 | 5.19 | 13.80 | 5.47 | 12.93 | 6.06 | 12.05 | 6.42 | 10.79 | 6.84 |
| | 8 | 15.91 | 4.41 | 15.06 | 4.60 | 14.74 | 4.96 | 14.29 | 5.22 | 14.19 | 5.51 | 13.31 | 6.11 | 12.44 | 6.47 | 11.27 | 6.87 |
| | 10 | 16.13 | 4.41 | 15.35 | 4.62 | 14.97 | 5.00 | 14.58 | 5.26 | 14.58 | 5.58 | 13.70 | 6.19 | 13.02 | 6.55 | 11.86 | 6.92 |
| | 12 | 16.62 | 4.43 | 15.94 | 4.64 | 15.35 | 5.05 | 14.97 | 5.30 | 14.87 | 5.64 | 14.09 | 6.28 | 13.61 | 6.66 | 12.73 | 6.97 |
| | 15 | 17.30 | 4.43 | 16.52 | 4.66 | 15.94 | 5.09 | 15.55 | 5.36 | 15.26 | 5.72 | 14.58 | 6.36 | 14.29 | 6.78 | 13.55 | 7.07 |
| 20 T | 5 | 21.00 | 5.36 | 20.83 | 5.69 | 20.09 | 5.96 | 19.74 | 6.19 | 19.16 | 6.67 | 17.06 | 7.35 | 16.29 | 7.83 | 14.21 | 8.35 |
| | 6 | 22.24 | 5.39 | 21.68 | 5.75 | 20.88 | 6.02 | 20.45 | 6.25 | 19.80 | 7.00 | 17.97 | 7.40 | 17.12 | 7.93 | 16.20 | 8.40 |
| | 7 | 23.17 | 5.43 | 22.58 | 5.80 | 21.67 | 6.08 | 21.21 | 6.30 | 19.40 | 7.04 | 18.87 | 7.46 | 17.91 | 8.05 | 16.97 | 8.45 |
| | 8 | 23.89 | 5.46 | 23.25 | 5.83 | 22.30 | 6.14 | 21.73 | 6.36 | 20.86 | 7.08 | 19.31 | 7.52 | 18.27 | 8.11 | 17.26 | 8.50 |
| | 10 | 25.30 | 5.54 | 24.60 | 5.89 | 23.53 | 6.20 | 22.88 | 6.42 | 21.88 | 7.11 | 20.38 | 7.58 | 19.22 | 8.17 | 18.12 | 8.55 |
| | 12 | 26.79 | 5.60 | 25.99 | 5.93 | 24.79 | 6.23 | 24.02 | 6.46 | 22.94 | 7.11 | 21.39 | 7.64 | 20.14 | 8.23 | 18.92 | 8.60 |
| | 15 | 29.24 | 5.69 | 28.04 | 6.01 | 26.64 | 6.30 | 25.75 | 6.53 | 24.54 | 7.15 | 23.05 | 7.72 | 21.62 | 8.27 | 20.30 | 8.70 |
| 27 T | 5 | 28.29 | 6.97 | 27.71 | 7.17 | 26.71 | 7.51 | 26.26 | 7.80 | 25.49 | 8.78 | 22.69 | 9.26 | 21.67 | 9.87 | 20.49 | 10.60 |
| | 6 | 29.58 | 7.01 | 28.84 | 7.25 | 27.77 | 7.58 | 27.19 | 7.87 | 26.33 | 8.82 | 23.90 | 9.33 | 22.77 | 10.00 | 21.55 | 10.71 |
| | 7 | 30.82 | 7.09 | 30.03 | 7.31 | 28.82 | 7.66 | 28.20 | 7.94 | 25.80 | 8.87 | 25.09 | 9.40 | 23.82 | 10.14 | 22.57 | 10.86 |
| | 8 | 31.77 | 7.12 | 30.92 | 7.34 | 29.66 | 7.73 | 28.90 | 8.01 | 27.74 | 8.92 | 25.68 | 9.47 | 24.30 | 10.22 | 22.95 | 10.98 |
| | 10 | 33.64 | 7.20 | 32.72 | 7.43 | 31.30 | 7.81 | 30.43 | 8.09 | 29.10 | 8.96 | 27.11 | 9.55 | 25.56 | 10.30 | 24.10 | 11.06 |
| | 12 | 35.63 | 7.23 | 34.57 | 7.47 | 32.96 | 7.85 | 31.94 | 8.13 | 30.50 | 8.96 | 28.45 | 9.63 | 26.79 | 10.37 | 25.16 | 11.14 |
| | 15 | 38.52 | 7.33 | 37.30 | 7.57 | 35.43 | 7.94 | 34.25 | 8.23 | 32.63 | 9.01 | 30.65 | 9.73 | 28.75 | 10.41 | 26.95 | 11.22 |

## Table 4. Cooling capacities YLHA PLUS 5 to 27 (35% ethylene glycol)

| Model YLHA PLUS | Water outlet temp. °C | Outdoor ambient temperature °C DB (80% RH) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20 | | 25 | | 30 | | 32 | | 35 | | 40 | | 43 | | 46 | |
| | | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power |
| | | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW |
| 5 M | -5 | 3.62 | 1.15 | 3.46 | 1.24 | 3.29 | 1.35 | 3.21 | 1.40 | 3.10 | 1.47 | 2.84 | 1.61 | 2.69 | 1.69 | 2.54 | 1.78 |
| | -4 | 3.81 | 1.17 | 3.64 | 1.27 | 3.45 | 1.38 | 3.37 | 1.43 | 3.25 | 1.50 | 2.98 | 1.64 | 2.82 | 1.73 | 2.65 | 1.83 |
| | -2 | 4.16 | 1.23 | 4.00 | 1.33 | 3.78 | 1.45 | 3.70 | 1.50 | 3.56 | 1.57 | 3.27 | 1.72 | 3.09 | 1.81 | 2.89 | 1.91 |
| | 0 | 4.51 | 1.29 | 4.38 | 1.39 | 4.16 | 1.51 | 4.04 | 1.56 | 3.89 | 1.64 | 3.57 | 1.80 | 3.38 | 1.89 | 3.13 | 1.99 |
| | 2 | 5.00 | 1.35 | 4.77 | 1.45 | 4.53 | 1.58 | 4.41 | 1.63 | 4.25 | 1.72 | 3.90 | 1.88 | 3.69 | 1.97 | 3.48 | 2.06 |
| | 4 | 5.35 | 1.40 | 5.16 | 1.52 | 4.90 | 1.65 | 4.79 | 1.70 | 4.61 | 1.79 | 4.23 | 1.96 | 4.00 | 2.06 | 3.78 | 2.18 |
| 7 M | -5 | 4.76 | 1.55 | 4.54 | 1.68 | 4.33 | 1.83 | 4.23 | 1.89 | 4.07 | 1.98 | 3.73 | 2.17 | 3.53 | 2.28 | 3.34 | 2.40 |
| | -4 | 5.01 | 1.59 | 4.79 | 1.72 | 4.53 | 1.87 | 4.43 | 1.93 | 4.27 | 2.03 | 3.91 | 2.22 | 3.70 | 2.33 | 3.48 | 2.48 |
| | -2 | 5.47 | 1.66 | 5.26 | 1.80 | 4.97 | 1.96 | 4.86 | 2.02 | 4.68 | 2.12 | 4.30 | 2.32 | 4.06 | 2.44 | 3.80 | 2.58 |
| | 0 | 5.93 | 1.74 | 5.75 | 1.88 | 5.47 | 2.04 | 5.31 | 2.11 | 5.12 | 2.22 | 4.70 | 2.43 | 4.44 | 2.55 | 4.12 | 2.68 |
| | 2 | 6.57 | 1.82 | 6.27 | 1.96 | 5.95 | 2.13 | 5.80 | 2.20 | 5.59 | 2.32 | 5.13 | 2.54 | 4.85 | 2.67 | 4.58 | 2.79 |
| | 4 | 7.03 | 1.90 | 6.78 | 2.05 | 6.44 | 2.22 | 6.29 | 2.30 | 6.06 | 2.42 | 5.56 | 2.65 | 5.26 | 2.78 | 4.97 | 2.94 |
| 9 M | -5 | 5.83 | 2.08 | 5.57 | 2.25 | 5.30 | 2.45 | 5.18 | 2.53 | 4.99 | 2.66 | 4.58 | 2.91 | 4.33 | 3.06 | 4.09 | 3.22 |
| | -4 | 6.13 | 2.13 | 5.86 | 2.30 | 5.56 | 2.51 | 5.43 | 2.59 | 5.23 | 2.72 | 4.79 | 2.98 | 4.54 | 3.13 | 4.26 | 3.32 |
| | -2 | 6.70 | 2.23 | 6.45 | 2.41 | 6.09 | 2.62 | 5.95 | 2.71 | 5.74 | 2.85 | 5.26 | 3.11 | 4.98 | 3.27 | 4.65 | 3.46 |
| | 0 | 7.26 | 2.34 | 7.05 | 2.52 | 6.70 | 2.74 | 6.51 | 2.83 | 6.27 | 2.98 | 5.76 | 3.26 | 5.44 | 3.43 | 5.05 | 3.60 |
| | 2 | 8.05 | 2.44 | 7.68 | 2.63 | 7.30 | 2.86 | 7.11 | 2.96 | 6.85 | 3.11 | 6.28 | 3.40 | 5.94 | 3.58 | 5.61 | 3.74 |
| | 4 | 8.61 | 2.54 | 8.31 | 2.74 | 7.89 | 2.98 | 7.71 | 3.08 | 7.43 | 3.24 | 6.81 | 3.55 | 6.45 | 3.73 | 6.09 | 3.94 |
| 9 T | -5 | 5.83 | 2.08 | 5.57 | 2.25 | 5.30 | 2.45 | 5.18 | 2.53 | 4.99 | 2.66 | 4.58 | 2.91 | 4.33 | 3.06 | 4.09 | 3.22 |
| | -4 | 6.13 | 2.13 | 5.86 | 2.30 | 5.56 | 2.51 | 5.43 | 2.59 | 5.23 | 2.72 | 4.79 | 2.98 | 4.54 | 3.13 | 4.26 | 3.32 |
| | -2 | 6.70 | 2.23 | 6.45 | 2.41 | 6.09 | 2.62 | 5.95 | 2.71 | 5.74 | 2.85 | 5.26 | 3.11 | 4.98 | 3.27 | 4.65 | 3.46 |
| | 0 | 7.26 | 2.34 | 7.05 | 2.52 | 6.70 | 2.74 | 6.51 | 2.83 | 6.27 | 2.98 | 5.76 | 3.26 | 5.44 | 3.43 | 5.05 | 3.60 |
| | 2 | 8.05 | 2.44 | 7.68 | 2.63 | 7.30 | 2.86 | 7.11 | 2.96 | 6.85 | 3.11 | 6.28 | 3.40 | 5.94 | 3.58 | 5.61 | 3.74 |
| | 4 | 8.61 | 2.54 | 8.31 | 2.74 | 7.89 | 2.98 | 7.71 | 3.08 | 7.43 | 3.24 | 6.81 | 3.55 | 6.45 | 3.73 | 6.09 | 3.94 |
| 12 M | -5 | 7.87 | 2.56 | 7.52 | 2.78 | 7.16 | 3.02 | 6.99 | 3.12 | 6.74 | 3.28 | 6.18 | 3.59 | 5.85 | 3.77 | 5.52 | 3.97 |
| | -4 | 8.28 | 2.63 | 7.92 | 2.84 | 7.50 | 3.09 | 7.33 | 3.19 | 7.06 | 3.36 | 6.48 | 3.67 | 6.13 | 3.86 | 5.76 | 4.10 |
| | -2 | 9.05 | 2.75 | 8.71 | 2.97 | 8.23 | 3.24 | 8.04 | 3.34 | 7.75 | 3.52 | 7.11 | 3.84 | 6.72 | 4.04 | 6.29 | 4.27 |
| | 0 | 9.81 | 2.88 | 9.52 | 3.11 | 9.05 | 3.38 | 8.79 | 3.49 | 8.47 | 3.67 | 7.77 | 4.02 | 7.35 | 4.23 | 6.82 | 4.44 |
| | 2 | 10.87 | 3.01 | 10.37 | 3.25 | 9.85 | 3.53 | 9.60 | 3.65 | 9.25 | 3.84 | 8.49 | 4.20 | 8.03 | 4.41 | 7.58 | 4.61 |
| | 4 | 11.63 | 3.14 | 11.22 | 3.39 | 10.66 | 3.68 | 10.41 | 3.80 | 10.03 | 4.00 | 9.20 | 4.38 | 8.71 | 4.60 | 8.23 | 4.87 |
| 12 T | -5 | 8.04 | 2.50 | 7.68 | 2.71 | 7.31 | 2.94 | 7.14 | 3.04 | 6.88 | 3.20 | 6.31 | 3.50 | 5.97 | 3.67 | 5.64 | 3.87 |
| | -4 | 8.46 | 2.56 | 8.09 | 2.77 | 7.66 | 3.01 | 7.49 | 3.11 | 7.21 | 3.27 | 6.61 | 3.58 | 6.26 | 3.76 | 5.88 | 3.99 |
| | -2 | 9.24 | 2.68 | 8.89 | 2.89 | 8.41 | 3.15 | 8.21 | 3.26 | 7.91 | 3.43 | 7.26 | 3.74 | 6.86 | 3.94 | 6.42 | 4.16 |
| | 0 | 10.02 | 2.81 | 9.72 | 3.03 | 9.24 | 3.29 | 8.98 | 3.40 | 8.65 | 3.58 | 7.94 | 3.92 | 7.50 | 4.12 | 6.96 | 4.33 |
| | 2 | 11.10 | 2.93 | 10.59 | 3.16 | 10.06 | 3.44 | 9.81 | 3.56 | 9.45 | 3.74 | 8.67 | 4.09 | 8.20 | 4.30 | 7.74 | 4.49 |
| | 4 | 11.88 | 3.06 | 11.46 | 3.30 | 10.89 | 3.59 | 10.64 | 3.71 | 10.25 | 3.90 | 9.40 | 4.26 | 8.89 | 4.48 | 8.40 | 4.74 |
| 15 T | -5 | 9.25 | 3.28 | 8.83 | 3.56 | 8.41 | 3.87 | 8.21 | 4.00 | 7.91 | 4.21 | 7.26 | 4.60 | 6.87 | 4.83 | 6.49 | 5.09 |
| | -4 | 9.73 | 3.36 | 9.30 | 3.64 | 8.81 | 3.96 | 8.61 | 4.09 | 8.29 | 4.30 | 7.61 | 4.71 | 7.20 | 4.95 | 6.76 | 5.25 |
| | -2 | 10.63 | 3.53 | 10.22 | 3.81 | 9.67 | 4.15 | 9.44 | 4.28 | 9.10 | 4.50 | 8.35 | 4.92 | 7.89 | 5.18 | 7.38 | 5.47 |
| | 0 | 11.52 | 3.69 | 11.18 | 3.98 | 10.63 | 4.33 | 10.33 | 4.48 | 9.95 | 4.71 | 9.13 | 5.15 | 8.63 | 5.41 | 8.00 | 5.69 |
| | 2 | 12.77 | 3.86 | 12.18 | 4.16 | 11.57 | 4.52 | 11.28 | 4.67 | 10.87 | 4.92 | 9.97 | 5.38 | 9.43 | 5.65 | 8.90 | 5.91 |
| | 4 | 13.66 | 4.02 | 13.18 | 4.34 | 12.52 | 4.72 | 12.23 | 4.87 | 11.78 | 5.13 | 10.81 | 5.61 | 10.22 | 5.89 | 9.66 | 6.24 |
| 20 T | -5 | 13.00 | 4.22 | 12.42 | 4.58 | 11.82 | 4.98 | 11.55 | 5.15 | 11.12 | 5.41 | 10.20 | 5.92 | 9.65 | 6.22 | 9.12 | 6.55 |
| | -4 | 13.68 | 4.33 | 13.08 | 4.69 | 12.39 | 5.10 | 12.10 | 5.27 | 11.66 | 5.54 | 10.69 | 6.06 | 10.12 | 6.37 | 9.51 | 6.76 |
| | -2 | 14.94 | 4.54 | 14.37 | 4.90 | 13.59 | 5.34 | 13.28 | 5.51 | 12.79 | 5.80 | 11.74 | 6.33 | 11.10 | 6.66 | 10.38 | 7.04 |
| | 0 | 16.20 | 4.75 | 15.72 | 5.12 | 14.94 | 5.57 | 14.52 | 5.76 | 13.98 | 6.06 | 12.83 | 6.63 | 12.13 | 6.97 | 11.25 | 7.32 |
| | 2 | 17.95 | 4.96 | 17.12 | 5.35 | 16.27 | 5.82 | 15.86 | 6.02 | 15.27 | 6.33 | 14.01 | 6.92 | 13.25 | 7.28 | 12.51 | 7.60 |
| | 4 | 19.21 | 5.17 | 18.53 | 5.58 | 17.60 | 6.07 | 17.19 | 6.27 | 16.57 | 6.60 | 15.20 | 7.22 | 14.37 | 7.58 | 13.58 | 8.03 |
| 27 T | -5 | 17.29 | 5.32 | 16.51 | 5.77 | 15.72 | 6.28 | 15.36 | 6.48 | 14.79 | 6.82 | 13.57 | 7.45 | 12.84 | 7.83 | 12.13 | 8.25 |
| | -4 | 18.19 | 5.46 | 17.39 | 5.90 | 16.48 | 6.43 | 16.09 | 6.63 | 15.50 | 6.98 | 14.22 | 7.63 | 13.46 | 8.02 | 12.64 | 8.52 |
| | -2 | 19.87 | 5.72 | 19.12 | 6.17 | 18.07 | 6.72 | 17.66 | 6.95 | 17.01 | 7.30 | 15.61 | 7.98 | 14.76 | 8.39 | 13.80 | 8.87 |
| | 0 | 21.54 | 5.99 | 20.90 | 6.45 | 19.87 | 7.02 | 19.31 | 7.26 | 18.59 | 7.63 | 17.07 | 8.35 | 16.13 | 8.78 | 14.96 | 9.22 |
| | 2 | 23.87 | 6.25 | 22.77 | 6.75 | 21.64 | 7.33 | 21.09 | 7.58 | 20.31 | 7.98 | 18.64 | 8.72 | 17.62 | 9.17 | 16.64 | 9.58 |
| | 4 | 25.54 | 6.52 | 24.64 | 7.04 | 23.40 | 7.65 | 22.87 | 7.90 | 22.03 | 8.32 | 20.21 | 9.09 | 19.12 | 9.56 | 18.06 | 10.11 |

## Table 5. Heating capacities YLHA PLUS 5 to 27

| Model YLHA PLUS | Water outlet temp. °C | Outdoor ambient temperature °C DB (80% RH) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -15 | | -10 | | -7 | | 0 | | 5 | | 7 | | 10 | | 15 | | 20 | |
| | | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power | Cap. | Abs. power |
| | | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW | kW |
| 5 M | 30 | 1.60 | 1.40 | 1.69 | 1.41 | 2.48 | 1.42 | 4.30 | 1.43 | 5.32 | 1.43 | 6.46 | 1.44 | 6.74 | 1.45 | 7.58 | 1.45 | 7.85 | 1.46 |
| | 35 | 1.51 | 1.35 | 1.89 | 1.55 | 2.40 | 1.56 | 4.25 | 1.57 | 5.28 | 1.58 | 6.40 | 1.60 | 6.62 | 1.60 | 7.52 | 1.61 | 7.63 | 1.62 |
| | 40 | - | - | 2.04 | 1.72 | 2.35 | 1.72 | 4.20 | 1.73 | 5.24 | 1.74 | 6.35 | 1.75 | 6.46 | 1.75 | 7.45 | 1.76 | 7.45 | 1.77 |
| | 45 | - | - | - | - | 2.32 | 1.91 | 4.15 | 1.88 | 5.19 | 1.89 | 6.30 | 1.90 | 6.45 | 1.91 | 7.39 | 1.92 | 7.32 | 1.92 |
| | 50 | - | - | - | - | - | - | 4.10 | 2.00 | 5.11 | 2.02 | 6.25 | 2.03 | 6.43 | 2.05 | 6.85 | 2.06 | 7.19 | 2.08 |
| 7 M | 30 | 1.82 | 1.82 | 2.84 | 1.85 | 4.10 | 1.93 | 5.06 | 1.85 | 6.00 | 1.86 | 7.29 | 1.87 | 7.60 | 1.88 | 8.54 | 1.89 | 8.85 | 1.90 |
| | 35 | 1.70 | 1.75 | 2.83 | 2.03 | 3.87 | 2.11 | 4.95 | 2.04 | 5.95 | 2.06 | 7.21 | 2.07 | 7.46 | 2.08 | 8.47 | 2.09 | 8.60 | 2.10 |
| | 40 | - | - | 2.81 | 2.21 | 3.76 | 2.23 | 4.85 | 2.25 | 5.90 | 2.26 | 7.16 | 2.27 | 7.29 | 2.28 | 8.40 | 2.29 | 8.40 | 2.30 |
| | 45 | - | - | - | - | 3.59 | 2.45 | 4.77 | 2.45 | 5.85 | 2.46 | 7.10 | 2.47 | 7.27 | 2.48 | 8.32 | 2.49 | 8.25 | 2.50 |
| | 50 | - | - | - | - | - | - | 4.65 | 2.60 | 5.75 | 2.62 | 7.04 | 2.64 | 7.25 | 2.66 | 7.72 | 2.68 | 8.10 | 2.70 |
| 9 M | 30 | 2.41 | 2.00 | 3.52 | 2.05 | 5.09 | 2.13 | 6.69 | 2.20 | 8.04 | 2.20 | 9.77 | 2.21 | 10.19 | 2.22 | 11.46 | 2.23 | 12.28 | 2.25 |
| | 35 | 2.28 | 2.20 | 3.51 | 2.23 | 4.81 | 2.33 | 6.58 | 2.46 | 7.98 | 2.48 | 9.67 | 2.49 | 10.00 | 2.50 | 11.36 | 2.52 | 12.05 | 2.53 |
| | 40 | - | - | 3.49 | 2.43 | 4.67 | 2.54 | 6.46 | 2.72 | 7.91 | 2.76 | 9.59 | 2.77 | 9.77 | 2.78 | 11.26 | 2.80 | 11.81 | 2.81 |
| | 45 | - | - | - | - | 4.45 | 2.74 | 6.34 | 2.97 | 7.85 | 3.09 | 9.52 | 3.15 | 9.74 | 3.16 | 11.16 | 3.18 | 11.58 | 3.18 |
| | 50 | - | - | - | - | - | - | 6.22 | 3.20 | 7.71 | 3.21 | 9.45 | 3.31 | 9.72 | 3.32 | 10.36 | 3.33 | 11.42 | 3.35 |
| 9 T | 30 | 2.41 | 2.00 | 3.52 | 2.05 | 5.09 | 2.13 | 6.69 | 2.20 | 8.04 | 2.20 | 9.77 | 2.21 | 10.19 | 2.22 | 11.46 | 2.23 | 12.28 | 2.25 |
| | 35 | 2.28 | 2.20 | 3.51 | 2.23 | 4.81 | 2.33 | 6.58 | 2.46 | 7.98 | 2.48 | 9.67 | 2.49 | 10.00 | 2.50 | 11.36 | 2.52 | 12.05 | 2.53 |
| | 40 | - | - | 3.49 | 2.43 | 4.67 | 2.54 | 6.46 | 2.72 | 7.91 | 2.76 | 9.59 | 2.77 | 9.77 | 2.78 | 11.26 | 2.80 | 11.81 | 2.81 |
| | 45 | - | - | - | - | 4.45 | 2.74 | 6.34 | 2.97 | 7.85 | 3.09 | 9.52 | 3.15 | 9.74 | 3.16 | 11.16 | 3.18 | 11.58 | 3.18 |
| | 50 | - | - | - | - | - | - | 6.22 | 3.20 | 7.71 | 3.21 | 9.45 | 3.31 | 9.72 | 3.32 | 10.36 | 3.33 | 11.42 | 3.35 |
| 12 M | 30 | 3.11 | 2.40 | 4.75 | 2.50 | 6.78 | 2.60 | 8.20 | 2.72 | 10.35 | 2.74 | 12.57 | 2.75 | 13.11 | 2.76 | 14.74 | 2.78 | 15.80 | 2.80 |
| | 35 | 2.93 | 2.70 | 4.73 | 2.80 | 6.41 | 2.90 | 8.06 | 3.08 | 10.26 | 3.09 | 12.44 | 3.10 | 12.86 | 3.11 | 14.62 | 3.13 | 15.50 | 3.15 |
| | 40 | - | - | 4.71 | 3.00 | 6.24 | 3.10 | 7.90 | 3.42 | 10.18 | 3.44 | 12.35 | 3.45 | 12.57 | 3.46 | 14.49 | 3.48 | 15.20 | 3.50 |
| | 45 | - | - | - | - | 5.95 | 3.40 | 7.80 | 3.70 | 10.10 | 3.85 | 12.25 | 3.92 | 12.54 | 3.94 | 14.36 | 3.95 | 14.90 | 3.96 |
| | 50 | - | - | - | - | - | - | 7.70 | 3.90 | 9.93 | 4.00 | 12.15 | 4.12 | 12.51 | 4.13 | 13.33 | 4.15 | 14.70 | 4.17 |
| 12 T | 30 | 3.15 | 2.86 | 3.66 | 2.86 | 5.08 | 2.87 | 8.33 | 2.88 | 10.51 | 2.90 | 12.77 | 2.91 | 13.31 | 2.92 | 14.97 | 2.94 | 16.05 | 2.96 |
| | 35 | 2.98 | 3.23 | 3.45 | 3.24 | 4.77 | 3.33 | 8.19 | 3.26 | 10.42 | 3.27 | 12.64 | 3.28 | 13.06 | 3.29 | 14.84 | 3.31 | 15.74 | 3.33 |
| | 40 | - | - | 3.25 | 3.49 | 4.57 | 3.49 | 8.02 | 3.62 | 10.34 | 3.64 | 12.54 | 3.65 | 12.77 | 3.66 | 14.71 | 3.68 | 15.44 | 3.71 |
| | 45 | - | - | - | - | 4.27 | 3.65 | 7.92 | 3.92 | 10.25 | 4.08 | 12.44 | 4.15 | 12.73 | 4.17 | 14.58 | 4.18 | 15.13 | 4.19 |
| | 50 | - | - | - | - | - | - | 7.82 | 4.13 | 10.08 | 4.23 | 12.34 | 4.36 | 12.70 | 4.37 | 13.53 | 4.39 | 14.93 | 4.41 |
| 15 T | 30 | 4.08 | 3.50 | 6.05 | 3.56 | 8.75 | 3.57 | 10.78 | 3.58 | 13.60 | 3.61 | 16.52 | 3.62 | 17.23 | 3.63 | 19.38 | 3.66 | 20.77 | 3.69 |
| | 35 | 3.85 | 3.80 | 6.02 | 3.87 | 8.26 | 4.03 | 10.59 | 4.05 | 13.49 | 4.07 | 16.35 | 4.08 | 16.91 | 4.09 | 19.21 | 4.12 | 20.37 | 4.15 |
| | 40 | - | - | 6.00 | 4.22 | 8.02 | 4.41 | 10.38 | 4.50 | 13.38 | 4.53 | 16.23 | 4.54 | 16.52 | 4.55 | 19.04 | 4.58 | 19.98 | 4.61 |
| | 45 | - | - | - | - | 7.65 | 4.75 | 10.25 | 4.87 | 13.27 | 5.07 | 16.10 | 5.16 | 16.48 | 5.18 | 18.88 | 5.20 | 19.58 | 5.21 |
| | 50 | - | - | - | - | - | - | 10.12 | 5.13 | 13.05 | 5.27 | 15.97 | 5.42 | 16.44 | 5.44 | 17.52 | 5.46 | 19.32 | 5.49 |
| 20 T | 30 | 8.55 | 4.25 | 10.29 | 4.32 | 14.87 | 4.48 | 18.60 | 4.80 | 19.40 | 4.85 | 20.66 | 4.90 | 22.81 | 4.56 | 25.15 | 4.65 | 26.30 | 4.77 |
| | 35 | 8.30 | 4.70 | 9.68 | 4.77 | 13.27 | 4.97 | 18.15 | 5.26 | 19.26 | 5.32 | 20.49 | 5.41 | 22.63 | 5.60 | 24.94 | 5.99 | 25.87 | 5.25 |
| | 40 | - | - | 9.08 | 5.27 | 12.15 | 5.50 | 16.80 | 5.90 | 18.48 | 5.96 | 20.31 | 6.04 | 22.45 | 6.12 | 24.72 | 6.57 | 25.45 | 5.75 |
| | 45 | - | - | - | - | 10.82 | 5.99 | 15.41 | 6.49 | 17.78 | 6.56 | 20.14 | 6.60 | 22.23 | 6.46 | 24.50 | 6.50 | 25.02 | 6.55 |
| | 50 | - | - | - | - | - | - | 14.09 | 7.00 | 16.92 | 7.05 | 19.79 | 7.10 | 21.37 | 6.57 | 22.74 | 6.62 | 24.60 | 6.72 |
| 27 T | 30 | 11.25 | 5.20 | 13.43 | 5.35 | 19.42 | 5.83 | 23.80 | 6.15 | 25.17 | 6.25 | 26.98 | 6.38 | 30.01 | 5.91 | 33.09 | 6.03 | 35.90 | 6.25 |
| | 35 | 10.92 | 5.90 | 12.94 | 6.04 | 17.32 | 6.47 | 23.50 | 6.85 | 25.12 | 6.92 | 26.75 | 7.04 | 29.78 | 7.26 | 32.81 | 7.77 | 34.80 | 6.80 |
| | 40 | - | - | 12.45 | 6.73 | 15.87 | 7.16 | 21.94 | 7.68 | 24.21 | 7.76 | 26.53 | 7.86 | 29.54 | 7.93 | 32.53 | 8.52 | 34.00 | 7.45 |
| | 45 | - | - | - | - | 14.86 | 7.73 | 20.12 | 8.45 | 23.23 | 8.54 | 26.30 | 8.59 | 29.25 | 8.37 | 32.24 | 8.42 | 33.50 | 8.49 |
| | 50 | - | - | - | - | - | - | 18.41 | 9.11 | 22.12 | 9.18 | 25.85 | 9.24 | 28.12 | 8.51 | 29.92 | 8.58 | 32.80 | 9.15 |

## Table 6. Available pressure for hydraulic circuit (without filter installed)

| Model | Flow l/h | DISP. kPa |
|---|---|---|
| **YLCA/ YLHA PLUS 05** | 600 | 61 |
| | 800 | 55 |
| | 1 000 | 46 |
| | 1 200 | 36 |
| | 1 400 | 25 |
| **YLCA/ YLHA PLUS 07** | 800 | 96 |
| | 1 000 | 91 |
| | 1 200 | 81 |
| | 1 400 | 70 |
| | 1 600 | 58 |
| | 1 800 | 45 |
| | 2 000 | 28 |
| **YLCA/ YLHA PLUS 09** | 1 000 | 95 |
| | 1 200 | 88 |
| | 1 400 | 80 |
| | 1 600 | 70 |
| | 1 800 | 60 |
| | 2 000 | 49 |
| | 2 200 | 37 |
| | 2 400 | 24 |
| **YLCA/ YLHA PLUS 12** | 1 400 | 149 |
| | 1 700 | 134 |
| | 2 000 | 118 |
| | 2 300 | 95 |
| | 2 600 | 62 |
| | 2 900 | 30 |

## Table 6. (Cont.)

| Model | Flow l/h | DISP. kPa |
|---|---|---|
| **YLCA/ YLHA PLUS 15** | 1 700 | 221 |
| | 2 000 | 200 |
| | 2 300 | 170 |
| | 2 600 | 140 |
| | 2 900 | 105 |
| | 3 200 | 60 |
| | 3 500 | 10 |
| **YLCA/ YLHA PLUS 20** | 2 000 | 175 |
| | 2 500 | 160 |
| | 3 000 | 145 |
| | 3 500 | 125 |
| | 4 000 | 105 |
| | 4 500 | 83 |
| | 5 000 | 60 |
| | 5 500 | 30 |
| **YLCA/ YLHA PLUS 27** | 3 000 | 245 |
| | 3 500 | 228 |
| | 4 000 | 208 |
| | 4 500 | 187 |
| | 5 000 | 163 |
| | 5 500 | 140 |
| | 6 000 | 112 |
| | 6 500 | 83 |
| | 7 000 | 49 |
| | 7 500 | 15 |

Details with water at 10° C.
If using glycol, apply the correcting factors indicated in Table 8.

## Table 7. Pressure drops of filters

### 1" filter

| **Flow l/h** | 600 | 800 | 1 000 | 1 200 | 1 400 | 1 600 | 1 800 | 2 000 | 2 200 | 2 400 | 2 600 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **kPa** | 0.7 | 1.4 | 2.6 | 4.3 | 6.4 | 8.9 | 11.8 | 15.1 | 18.8 | 22.8 | 27.1 |

### 1 $^{1}/_{4}$" filter

| **Flow l/h** | 1 500 | 2 000 | 2 500 | 3 000 | 3 500 | 4 000 | 4 500 | 5 000 | 5 500 | 6 000 |
|---|---|---|---|---|---|---|---|---|---|---|
| **kPa** | 0.9 | 1.5 | 2.6 | 3.9 | 5.6 | 7.7 | 10.1 | 12.8 | 15.7 | 18.8 |

Data with water at 10° C. In the case of using glycol, apply correcting factors indicated in table 8.

## Table 8. Correcting factors for other glycol concentrations

| % in weight | Ethylene glycol | | Propylene glycol | |
|---|---|---|---|---|
| | Capacity | Absorbed power | Capacity | Absorbed power |
| 10 | 1.061 | 1.025 | 1.097 | 1.033 |
| 20 | 1.036 | 1.015 | 1.067 | 1.023 |
| 30 | 1.015 | 1.005 | 1.026 | 1.008 |
| 35 | 1 | 1 | 1 | 1 |
| 40 | 0.985 | 0.995 | 0.974 | 0.992 |
| 50 | 0.954 | 0.985 | 0.923 | 0.977 |

If it is necessary to make this selection with different glycol percentages, correct the capacities and absorbed power in table 2 and 4 (35% ethylene glycol), multiplying them by the coefficients indicated in table 8.

## Table 9. Sound power spectrum

| Models | Frequency (Hz) | | | | | | | dB(A) |
|---|---|---|---|---|---|---|---|---|
| | 125 | 250 | 500 | 1 000 | 2 000 | 4 000 | 8 000 | |
| **YLCA/YLHA PLUS 5** | 66.2 | 70.5 | 67.7 | 65.7 | 60.2 | 55.1 | 48.8 | 70 |
| **YLCA/YLHA PLUS 7** | 66.2 | 70.5 | 67.7 | 65.7 | 60.2 | 55.1 | 48.8 | 70 |
| **YLCA/YLHA PLUS 9** | 74 | 72.3 | 67.9 | 66.1 | 61.8 | 56.3 | 52.3 | 71 |
| **YLCA/YLHA PLUS 12** | 79.6 | 74.3 | 70.2 | 67.5 | 62.7 | 57.7 | 51.0 | 73 |
| **YLCA/YLHA PLUS 15** | 79.6 | 74.3 | 70.2 | 67.5 | 62.7 | 57.7 | 51.0 | 73 |
| **YLCA/YLHA PLUS 20** | 77 | 72.4 | 72.9 | 69.1 | 63.9 | 58.2 | 52.5 | 74 |
| **YLCA/YLHA PLUS 27** | 75.6 | 81.3 | 75.9 | 70.8 | 68.6 | 63.3 | 55.7 | 78 |

The information appearing in this table is sound pressure values as per ISO EN3743.

# Selection guide (YLCA and YLHA PLUS)

## Necessary information

The following information is needed to select a YLCA water chiller:

1. Cooling capacity needed.
2. Design cold water input and output temperatures.
3. Design water flow, if any of the temperatures in above point 2 is unknown.
4. Design input temperature of air to the condensing unit. Normally, this will be the design ambient temperature of summer air, unless influenced by the situation or other factors.
5. Altitude above sea level.
6. Design gumming coefficient of the evaporating unit.

**Note:** Points 1, 2 and 3 should be related by means of the following formulae:

$$\text{Cooling capacity kW} = \frac{\text{l/h cold water x °C differential}}{860}$$

### Selection example

A chiller is required to chill water from 13° C to 7° C, with a cooling capacity of 5 kW.

Here are other design conditions:

Ambient air entering the condensing unit: 35° C
Gumming coefficient: 0.044m² °C/kW
Altitude: At sea level

**Table 10. Gumming coefficients**

| Evaporating unit | | |
|---|---|---|
| Gumming coeff. m² °C/kW | Capacity factor | Comp. absorbed power factor |
| 0.044 | 1.000 | 1.000 |
| 0.088 | 0.987 | 0.995 |
| 0.176 | 0.964 | 0.985 |
| 0.352 | 0.926 | 0.962 |

**Table 11. Altitude factors**

| Altitude (m) | Capacity factor | Comp. absorbed power factor |
|---|---|---|
| 0 | 1.000 | 1.000 |
| 600 | 0.987 | 1.010 |
| 1 200 | 0.973 | 1.020 |
| 1 800 | 0.958 | 1.029 |
| 2 400 | 0.943 | 1.038 |

Taking a quick look at Table 1 we can see that a YLCA-5 unit gives an approximate required capacity of 5.38 kW.
As the factors appearing in Tables 10 and 11 are not applicable, conditions will be as follows:

Cooling capacity: 5.38 kW
Power consumed: 1.87 kW
Water temperature: 13° C to 7° C ($\Delta$t = 6)

$$\text{Water flow:} \quad \frac{5.38 \times 860}{6} = 771 \text{ l/h}$$

Available pressure in hydraulic circuit of a unit.

- From Table 6 we infer that the YLCA - 5 MC, with a 771 l/h flow, has an available pressure of 56 kPa.

Pressure drop in filter.

- From Table 7. 1" filter, we infer that with a 771 l/h flow, said filter has a pressure drop of 1.3 kPa.

### YLHA PLUS selection method

1. Determine the correct size of the YLHA PLUS unit by selecting a model from Tables 3 and 5 that is closest to the cooling and heating capacities required in the design conditions of the water outlet and air intake temperatures.
2. Apply gumming correcting factors (Table 10) and altitude (Table 11) to the capacity and power values that appear in the corresponding capacity tables in cool and heat. Make sure the corrected capacity is still sufficient for your needs.
3. Using the corrected capacities of the unit, select the design temperature differential, or the flow.
4. Check to make sure that these selections are within the YLCA/YLHA PLUS operating limits.

### YLHA PLUS selection example

A YLHA PLUS 5 heat pump operating at a 35° C ambient temperature should chill water from 13° C to 7° C, with a 5 kW cooling capacity.
A 4 kW heating capacity is required in 0° C design ambient temperature and a hot water output temperature of 45° C.
The gumming coefficient is 0.044 m² °C/kW, with the unit operating at sea level (no corrections).
With a quick glance of capacity Tables 3 and 5, we see that a YLHA PLUS 5 heat pump gives the approximate required capacities:

Cooling capacity = 5.40 kW
Total unit absorbed power = 1.91 kW
Cold water temperature = 13° C to 71 C ($\Delta$t: 6° C)
Hot and cold water flow = 774 l/h
Heating capacity = 4.15 kW
Total unit absorbed power in heat mode = 1.88 kW
Hot water output temperature = 45° C
Hot water temp. differential $= \frac{4.15 \times 860}{774} = 4.60°$ C
Thus. hot water return temperature is = 40.4° C

All values are within operating limits.
- Available pressure in hydraulic circuit of a unit with hydro kit.
  - From Table 6 we infer that the YLHA PLUS 5, with a 748 l/h flow, has an available pressure of 56.5 kPa.
- Pressure drop in filter.
  - From Table 7.1" filter, we infer that with a 748 l/h flow, said filter has a pressure drop of 1.2 kPa.

## Selection guide with glycol (cool only units)

**Necessary information**

The following information is needed to select a YLCA water chiller:

1. Cooling capacity needed.
2. Design cold water/glycol input and output temperatures to and from the condensing unit.
3. Design water/glycol flow.
4. Design input temperature of air to condensing unit. Normally, this will be the design ambient temperature of summer air, unless influenced by the situation or other factors.
5. Altitude above sea level.
6. Design gumming coefficient of the evaporating unit.

**Note:** Points 1, 2 and 3 should be related by means of the following formulae:

$$\text{Capacity (kW)} = \frac{\Delta t\ (°C) \times \text{Flow (litres/second)}}{\text{Glycol factor}}$$

In which $\Delta t$ = liquid intake temp. - liquid output temp.

To determine the glycol factor, please see Figure 1 for ethylene glycol, or Figure 3 for propylene glycol. For design output temperature, please see the recommended glycol concentration and the glycol factor in this concentration. This is the minimum concentration to be used for design output temperature. If a greater concentration is required, the glycol factor can be determined by means of Figure 2 on ethylene glycol or Figure 4 on propylene glycol.

**Selection method**

1. Determine the correct chiller model by selecting the one that is closest to the capacities required by the design conditions of the glycol outlet and air intake temperature.
2. Apply the gumming correcting factors that correspond to the gumming coefficient, altitude and glycol concentration, and to the capacity and power values that appear in the corresponding capacity tables. Make sure the corrected capacity is still sufficient for your needs.
3. Using the corrected capacities of the chiller, set the design temperature range, or the flow, to balance the formulae appearing in the "Necessary Information" section.
4. Always recheck to make sure these selections are within the specified design operating limits.

**Selection example**

A chiller is required to chill ethylene glycol from 1 to -4° C, with a capacity of 3.5 kW.

The following design conditions are applicable:

| | |
|---|---|
| Gumming coefficient: | 0.088m² °C/kW |
| Altitude: | 1 200 m |
| Ambient air: | 30° C |
| Concentration of glycol: | 30% w/w |

For a -4° C ethylene glycol output, the concentration recommended in Figure 1 is 30%. Therefore, the specified concentration is appropriate.

From Table 2 (capacities with 35% glycol) we infer that a YLCA - 5 unit, at the established design conditions, gives a capacity of 3.44 kW and a consumption of 1.35 kW.

With the design gumming coefficient, use the capacity correcting factors x 0.987 and power x 0.995 (Table 10).

On design altitude, apply the capacity correcting factors x 10.973 and power x 1.020 (Table 11).

On design glycol concentration, apply the capacity correcting factors x 1.015 and power x 1.005 (Table 3).

Applying these factors to the selection: YLCA - 5

Capacity = 3.44 x 0.987 x 0.973 x 1.015 = 3.35 kW

Comp. power = 1.35 x 0.995 x 1.020 x 1.005 = 1.37 kW

For the specified glycol concentration and a -4° C output temperature. Figure 3 shows a 0.248 glycol factor. Thus, the flow can be determined with the formula appearing in the "Necessary Information" section.

$$3.35\ \text{kW} = \frac{(1 - (-4)) \times \text{Flow (l/s)}}{0.248}$$

$$\text{Flow} = \frac{3.35 \times 0.248}{5} = 0.166\ \text{(l/s) or } 598\ \text{(l/h)}$$

This covers the limits of use.

The evaporating unit pressure drop can be determined by taking the water pressure drop value (Table 7) for a YLCA unit and multiplying it by the correcting factor (see Fig. 5) for a 30% concentration and an average temperature of -1.5° C, that is to say $\frac{1 + (-4)}{2} = -1.5$

42 kPa x 1.22 = 51.2 kPa

**Fig. 1 - Recommended ethylene glycol concentrations**

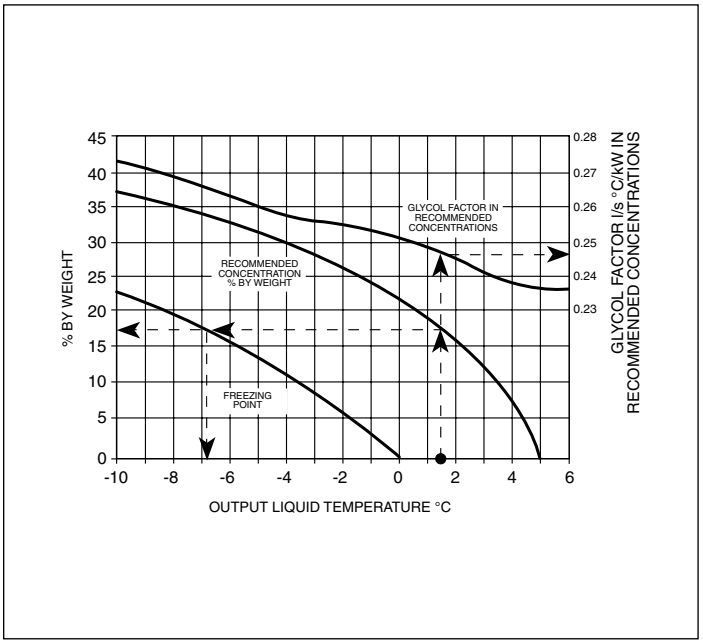

% BY WEIGHT
GLYCOL FACTOR I/s °C/kW IN RECOMMENDED CONCENTRATIONS
GLYCOL FACTOR IN RECOMMENDED CONCENTRATIONS
RECOMMENDED CONCENTRATION % BY WEIGHT
FREEZING POINT
OUTPUT LIQUID TEMPERATURE °C

**Fig. 2 - Ethylene glycol in other concentrations**

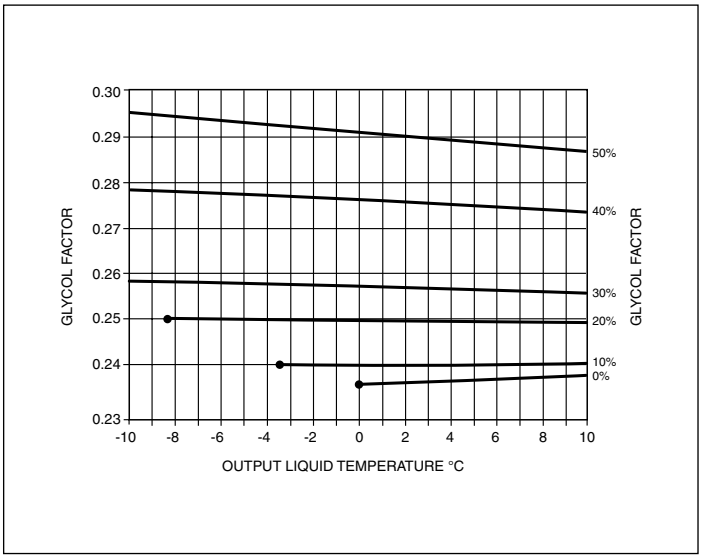



**Fig. 3 - Recommended propylene glycol concentrations**

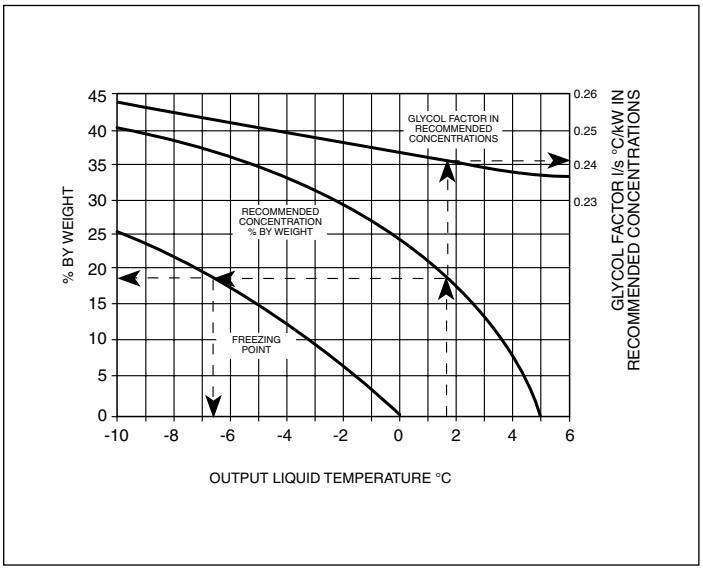

% BY WEIGHT
GLYCOL FACTOR I/s °C/kW IN RECOMMENDED CONCENTRATIONS
GLYCOL FACTOR IN RECOMMENDED CONCENTRATIONS
RECOMMENDED CONCENTRATION % BY WEIGHT
FREEZING POINT
OUTPUT LIQUID TEMPERATURE °C

**Fig. 4 - Propylene glycol in other concentrations**

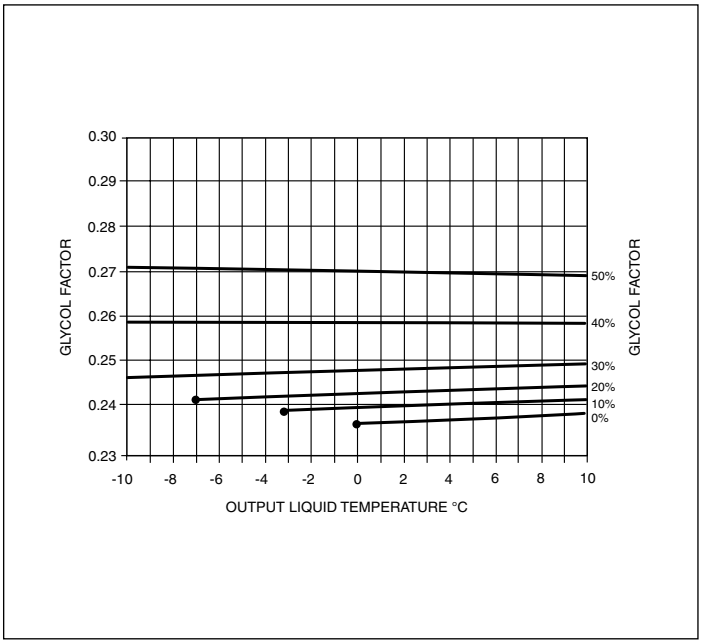



**Fig. 5 - Ethylene glycol pressure drop correcting factor**

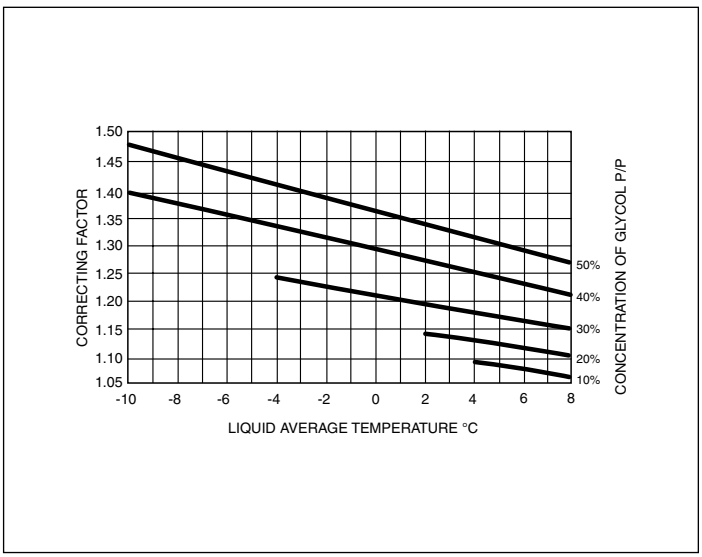
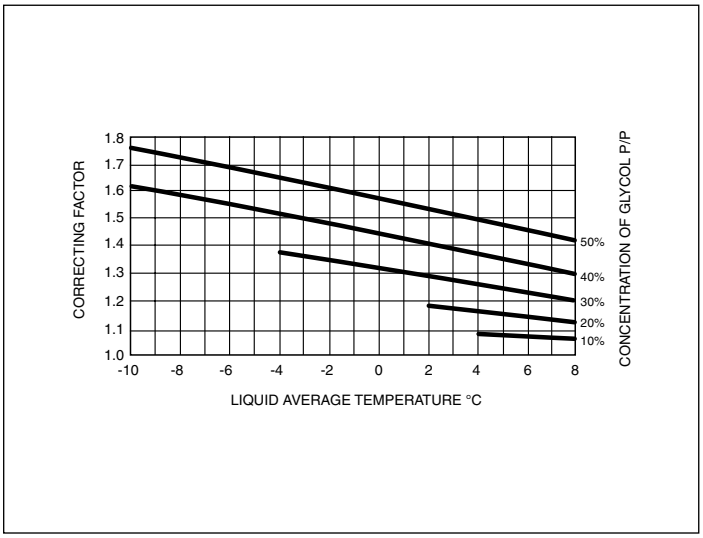



**Fig. 6 - Propylene glycol pressure drop correcting factors**



# Installation instructions

### Inspection

Upon reception, inspect the goods and notify the carrier and the insurance company, in writing, of any possible damage during transportation.

## Environmental protection

### Packing

Packing is made of recyclable material. Its elimination should be carried out in accordance with local regulations on selective collection of residual material.

### Refrigerant

**Contains greenhouse effect fluorided gas covered by the Kyoto protocol.**

For the type of gas and quantity per system, see the identification plate.

GWP (global warming potential): 2088.

## Elimination of the unit

Upon disassembly of the unit, the components should be recuperated ecologically. The cooling circuit is full of refrigerant that should be recuperated and returned to the gas manufacturer for recycling.

Oil will remain in the hermetic compressor and, therefore, must be returned with its circuit sealed.

The air conditioning unit will be deposited in an area determined by the local authorities, for its selective recuperation.

## Safety

Installation and maintenance servicing of this air conditioning system should be carried out by qualified and expert personnel. Maintenance servicing, such as cleaning coils and air filters, should be carried out regularly to maintain optimum performance of the units.

**CAUTION**

This unit should be installed and used in compliance with:
- Low voltage electro-technical regulations.
- Safety regulations for cooling plants and installations.
- Pressure device regulations.
- Basic building regulations.
- Local regulations.

## Transportation

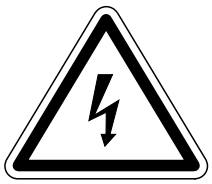
The units should always be transported in vertical position so as to avoid oil leaking out of the compressor. If, for any reason, this position need be changed sporadically, they will remain in that position a strictly necessary period of time only.

## Handling

The unit should be handled using the metal rails supplied for fastening and transportation.

## Warning signs

The following signs indicate the existence of potentially dangerous conditions for users or servicing personnel. Whenever found on the unit, take the meaning of each one into account.



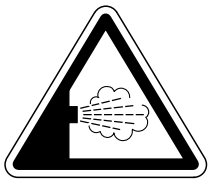
This symbol indicates an electrical danger or risk.

Caution: The unit is equipped with remote control system and can start automatically. Before accessing the interior, disconnect the power supply so as to avoid any contact with the fan turbine in motion.

Caution: Fan in operation.

Caution: It is obligatory to read the instructions prior to any handling.

Caution: Do not touch hot surfaces.



Caution: Possible gas leak due to inadequate handling.

## Location

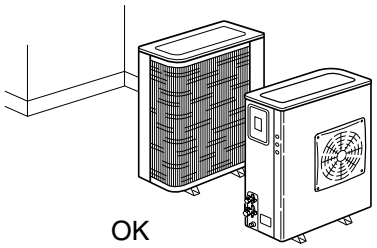
Before locating the unit, make sure you have received the appropriate product by checking the specifications described on the outside of same.

The unit should be placed on a perfectly horizontal plane, making sure the base can support the weight of the unit.

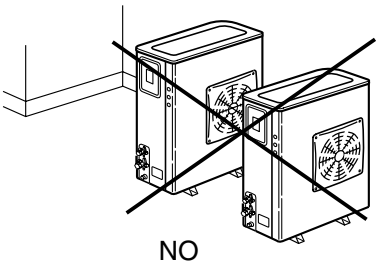
If vibration-free operation is required, the unit can be placed on a cork or similar anti-vibratory base, or fastened to the base with anti-vibratory plates or supports.

## Location of several units

Avoid the recirculation of air between units.



OK



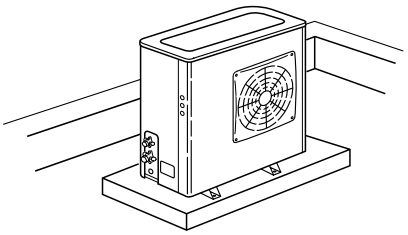
NO

## Fastening the unit

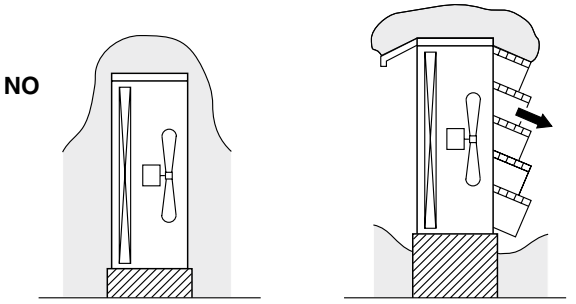
Before installing the unit, make sure the structure can support the weight of same.

If the unit is to be placed on the floor, a concrete base should be prepared so as to distribute weight evenly.

Place the unit on a consistent base and fasten by means of bolts, using the four drilled holes at the base of the unit. **Areas where it snows regularly**. If the unit is located outdoors and at ground level, it should be placed on supports so as to avoid obstruction of the air flow by an accumulation of snow. These supports should be above the height the snow normally reaches. It is convenient to install anti-snow grids.

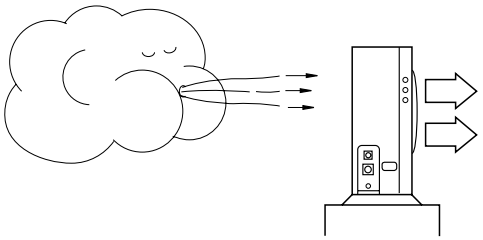


**YLCA/YLHA PLUS 5, 7, 9, 12, 15, 20 and 27**




## Orientation

Orient the unit in the direction of the predominating winds.



## Clearances

When installing each unit, clearances should be left for:

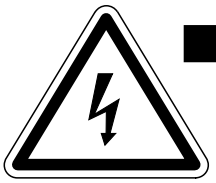
a) Air intake and discharge.
b) Maintenance servicing.
c) Power supply connections.

For proper operation, all minimum clearances shown on the general dimension diagrams should be respected always with regard to possible obstruction of air circulation of the work of a user.

# Wiring

## Electrical connections

All **established national regulations** should be complied. Each unit is supplied with a control box to which the power supply will be connected through a fused main switch or an automatic switch.



**WARNING**

Loose cables can cause overheating of terminals or incorrect operation of the unit. Fire hazards may also exist. Therefore, make sure all cables are connected firmly.

## Rotational direction of Scroll compressors

The Scroll compressors operate correctly in one single rotational direction. Although these units are protected by a phase order detector, when starting the equipment make sure the rotational direction is correct.

If it is not correct:

- The compressor does not compress.
- It makes a strange sound.
- Amperage consumption is limited.
- It overheats in excess.

The phase detector should have the led son for operation to be correct.

- Green led on means: Power ON.
- Yellow led on means: Relay ON.

## Hydraulic connections

The hydraulic connections of the water intake and outlet of the unit should be carried out respecting the intake and outlet directions indicated.

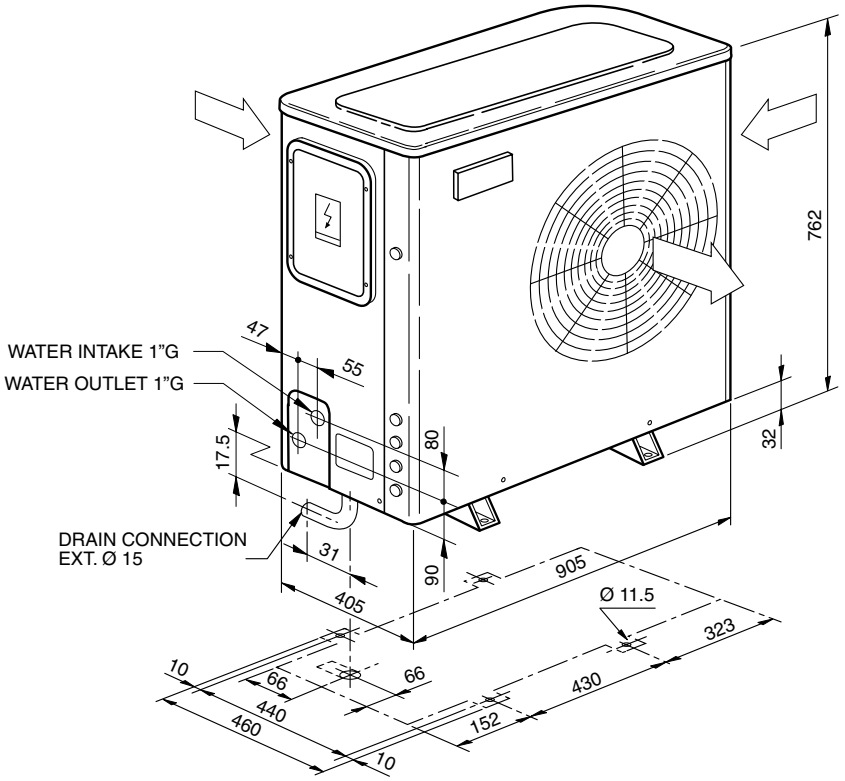
A galvanised iron or copper tubing can be used, with dimensions no lower than those indicated, and keeping in mind the pressure drops at said connections and in the internal exchanger of the installation.

During the winter season, with outdoor temperatures below 0° C, take precautions to avoid freezing of the water in the tubing network.

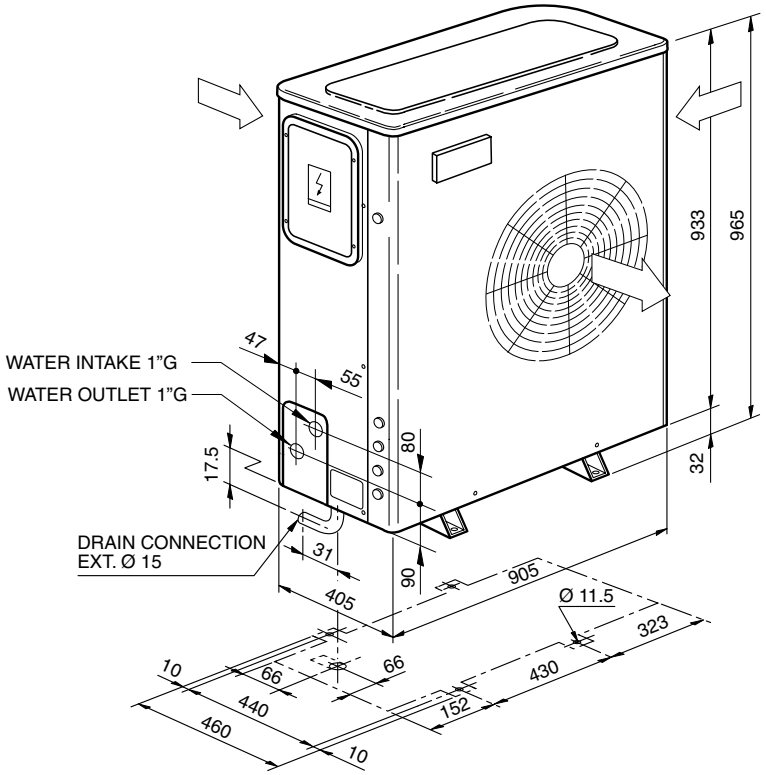
Usually, a solution is filling the circuit with an antifreeze mixture (glycol).

## General dimensions mm and hydraulic connections

### YLCA/YLHA PLUS 5

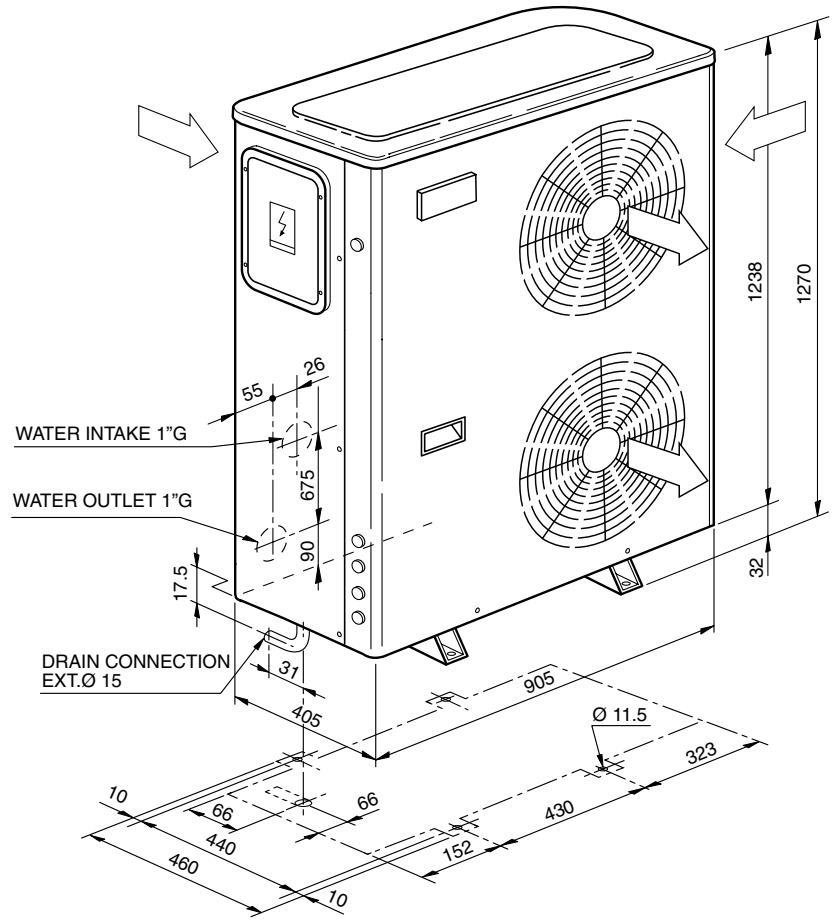



### YLCA/YLHA PLUS 7 - 9



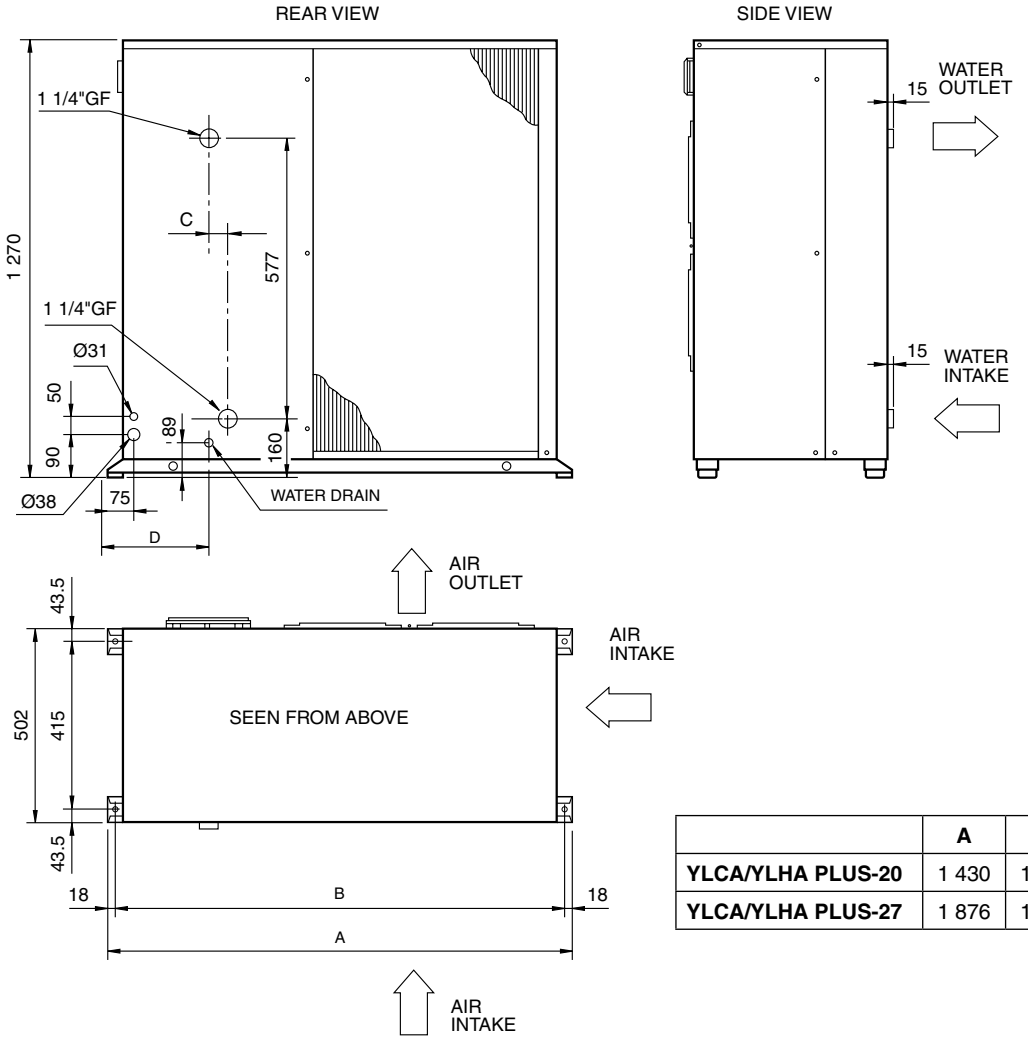
## General dimensions mm and hydraulic connections

### YLCA/YLHA PLUS 12 and 15

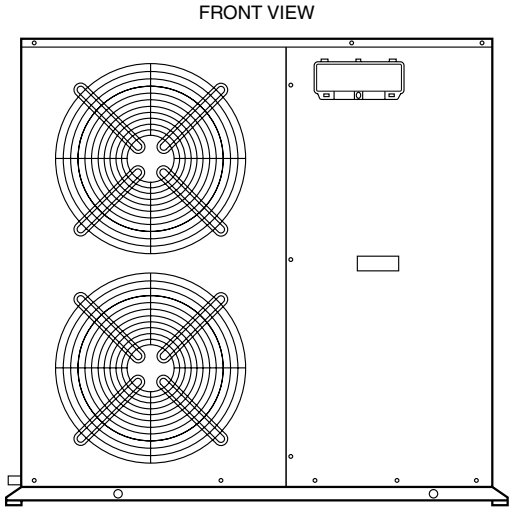


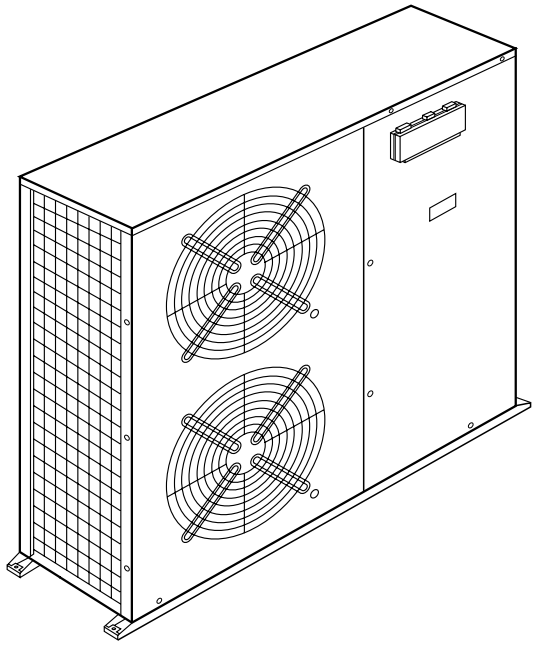
## General dimensions mm and hydraulic connections

### YLCA/YLHA PLUS 20 and 27



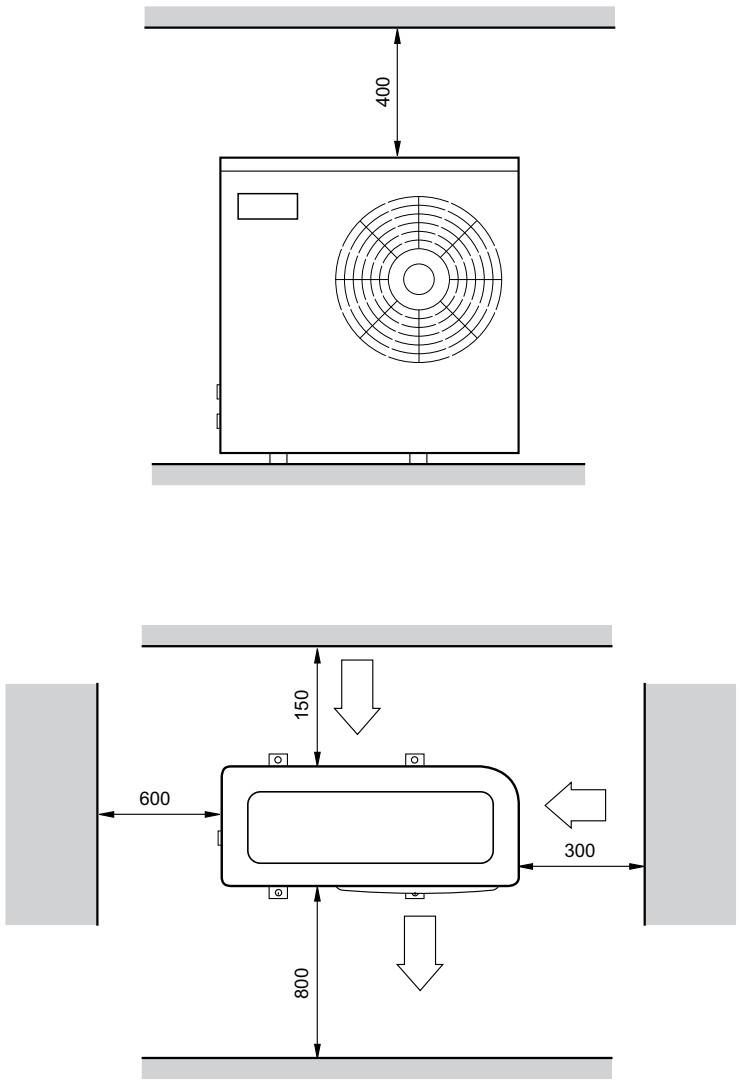

| | A | B | C | D |
|---|---|---|---|---|
| **YLCA/YLHA PLUS-20** | 1 430 | 1 394 | 136 | 428 |
| **YLCA/YLHA PLUS-27** | 1 876 | 1 840 | 144 | 432 |



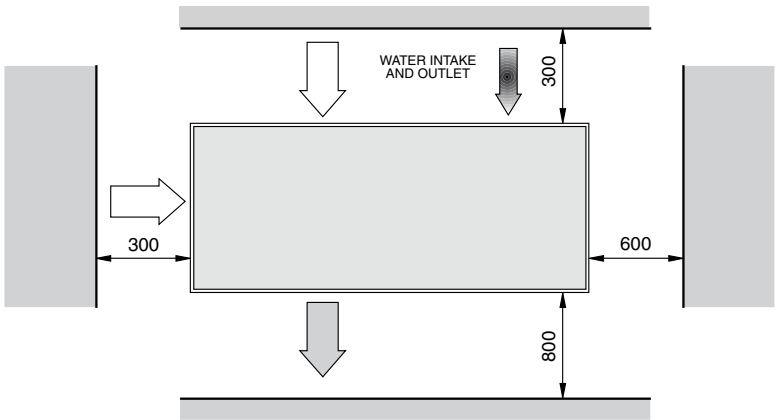



## Minimum technical clearances mm

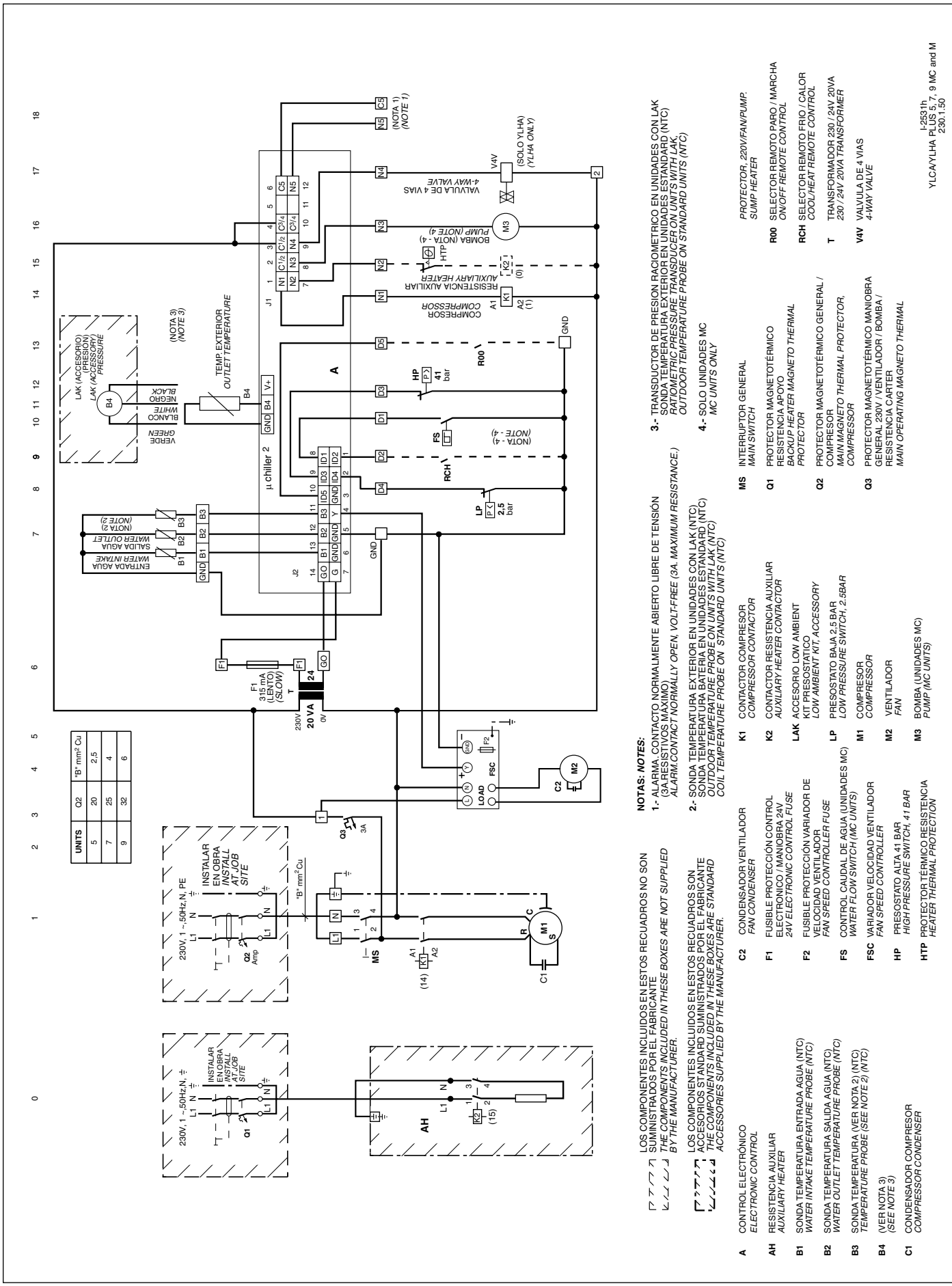
### YLCA 5, 7, 9, 12 and 15




### YLCA/YLHA PLUS 20 and 27



# Wiring diagram, YLCA/YLHA PLUS 5, 7, 9 MC and M, 230.1.50

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**NOTAS:** ***NOTES:***

**1.-** ALARMA. CONTACTO NORMALMENTE ABIERTO LIBRE DE TENSIÓN (3A RESISTIVOS MÁXIMO)
*ALARM.CONTACT NORMALLY OPEN, VOLT-FREE (3A. MAXIMUM RESISTANCE.)*

**2.-** SONDA TEMPERATURA EXTERIOR EN UNIDADES CON LAK (NTC)
SONDA TEMPERATURA BATERIA EN UNIDADES ESTANDARD (NTC)
*OUTDOOR TEMPERATURE PROBE ON UNITS WITH LAK (NTC)*
*COIL TEMPERATURE PROBE ON STANDARD UNITS (NTC)*

**3.-** TRANSDUCTOR DE PRESION RAQIOMETRICO EN UNIDADES CON LAK
SONDA TEMPERATURA EXTERIOR EN UNIDADES ESTANDARD (NTC)
*RATIOMETRIC PRESSURE TRANSDUCER ON UNITS WITH LAK*
*OUTDOOR TEMPERATURE PROBE ON STANDARD UNITS (NTC)*

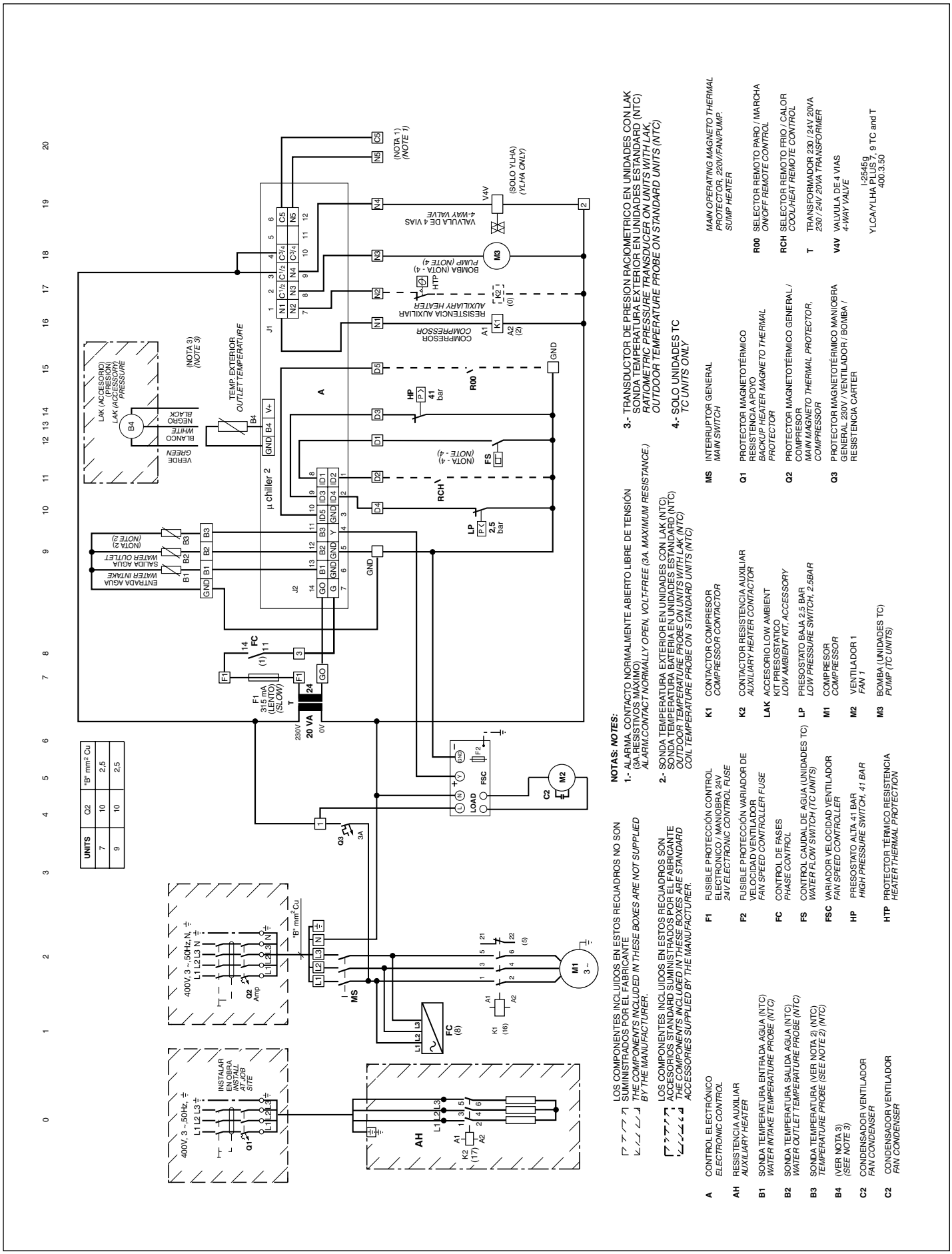
**4.-** SOLO UNIDADES MC
*MC UNITS ONLY*

| | | | | | |
|---|---|---|---|---|---|
| **A** | CONTROL ELECTRÓNICO<br>*ELECTRONIC CONTROL* | **C2** | CONDENSADOR VENTILADOR<br>*FAN CONDENSER* | **K1** | CONTACTOR COMPRESOR<br>*COMPRESSOR CONTACTOR* |
| **AH** | RESISTENCIA AUXILIAR<br>*AUXILIARY HEATER* | **F1** | FUSIBLE PROTECCIÓN CONTROL ELECTRONICO / MANIOBRA 24V<br>*24V ELECTRONIC CONTROL FUSE* | **K2** | CONTACTOR RESISTENCIA AUXILIAR<br>*AUXILIARY HEATER CONTACTOR* |
| **B1** | SONDA TEMPERATURA ENTRADA AGUA (NTC)<br>*WATER INTAKE TEMPERATURE PROBE (NTC)* | **F2** | FUSIBLE PROTECCIÓN VARIADOR DE VELOCIDAD VENTILADOR<br>*FAN SPEED CONTROLLER FUSE* | **LAK** | ACCESORIO LOW AMBIENT<br>KIT PRESOSTATICO<br>*LOW AMBIENT KIT, ACCESSORY* |
| **B2** | SONDA TEMPERATURA SALIDA AGUA (NTC)<br>*WATER OUTLET TEMPERATURE PROBE (NTC)* | **FS** | CONTROL CAUDAL DE AGUA (UNIDADES MC)<br>*WATER FLOW SWITCH (MC UNITS)* | **LP** | PRESOSTATO BAJA 2,5 BAR<br>*LOW PRESSURE SWITCH, 2.5BAR* |
| **B3** | SONDA TEMPERATURA (VER NOTA 2) (NTC)<br>*TEMPERATURE PROBE (SEE NOTE 2) (NTC)* | **FSC** | VARIADOR VELOCIDAD VENTILADOR<br>*FAN SPEED CONTROLLER* | **M1** | COMPRESOR<br>*COMPRESSOR* |
| **B4** | (VER NOTA 3)<br>*(SEE NOTE 3)* | **HP** | PRESOSTATO ALTA 41 BAR<br>*HIGH PRESSURE SWITCH, 41 BAR* | **M2** | VENTILADOR<br>*FAN* |
| **C1** | CONDENSADOR COMPRESOR<br>*COMPRESSOR CONDENSER* | **HTP** | PROTECTOR TÉRMICO RESISTENCIA<br>*HEATER THERMAL PROTECTION* | **M3** | BOMBA (UNIDADES MC)<br>*PUMP (MC UNITS)* |

| | | | | | |
|---|---|---|---|---|---|
| **MS** | INTERRUPTOR GENERAL<br>*MAIN SWITCH* | | | | *PROTECTOR, 220V/FAN/PUMP.*<br>*SUMP HEATER* |
| **Q1** | PROTECTOR MAGNETOTÉRMICO RESISTENCIA APOYO<br>*BACKUP HEATER MAGNETO THERMAL PROTECTOR* | **R00** | SELECTOR REMOTO PARO / MARCHA<br>*ON/OFF REMOTE CONTROL* | | |
| **Q2** | PROTECTOR MAGNETOTÉRMICO GENERAL / COMPRESOR<br>*MAIN MAGNETO THERMAL PROTECTOR, COMPRESSOR* | **RCH** | SELECTOR REMOTO FRIO / CALOR<br>*COOL/HEAT REMOTE CONTROL* | | |
| **Q3** | PROTECTOR MAGNETOTÉRMICO MANIOBRA GENERAL 230V / VENTILADOR / BOMBA / RESISTENCIA CARTER<br>*MAIN OPERATING MAGNETO THERMAL* | **T** | TRANSFORMADOR 230 / 24V 20VA<br>*230 / 24V 20VA TRANSFORMER* | | |
| | | **V4V** | VALVULA DE 4 VIAS<br>*4-WAY VALVE* | | |

L-2531h
YLCA/YLHA PLUS 5, 7, 9 MC and M
230.1.50

# Wiring diagram, YLCA/YLHA PLUS 7, 9 TC and T, 400.3.50

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**NOTAS:** ***NOTES:***

**1.-** ALARMA. CONTACTO NORMALMENTE ABIERTO LIBRE DE TENSIÓN (3A RESISTIVOS MAXIMO)
*ALARM.CONTACT NORMALLY OPEN, VOLT-FREE (3A. MAXIMUM RESISTANCE.)*

**2.-** SONDA TEMPERATURA EXTERIOR EN UNIDADES CON LAK (NTC).
SONDA TEMPERATURA BATERIA EN UNIDADES ESTANDARD (NTC)
*OUTDOOR TEMPERATURE PROBE ON UNITS WITH LAK (NTC)*
*COIL TEMPERATURE PROBE ON STANDARD UNITS (NTC)*

**3.-** TRANSDUCTOR DE PRESION RACIOMETRICO EN UNIDADES CON LAK
SONDA TEMPERATURA EXTERIOR EN UNIDADES ESTANDARD (NTC)
*RATIOMETHIC PRESSURE TRANSDUCER ON UNITS WITH LAK,*
*OUTDOOR TEMPERATURE PROBE ON STANDARD UNITS (NTC)*

**4.-** SOLO UNIDADES TC
*TC UNITS ONLY*

**A** CONTROL ELECTRÓNICO
*ELECTRONIC CONTROL*

**AH** RESISTENCIA AUXILIAR
*AUXILIARY HEATER*

**B1** SONDA TEMPERATURA ENTRADA AGUA (NTC)
*WATER INTAKE TEMPERATURE PROBE (NTC)*

**B2** SONDA TEMPERATURA SALIDA AGUA (NTC)
*WATER OUTLET TEMPERATURE PROBE (NTC)*

**B3** SONDA TEMPERATURA (VER NOTA 2). (NTC)
*TEMPERATURE PROBE (SEE NOTE 2) (NTC)*

**B4** (VER NOTA 3)
*(SEE NOTE 3)*

**C2** CONDENSADOR VENTILADOR
*FAN CONDENSER*

**C2** CONDENSADOR VENTILADOR
*FAN CONDENSER*

**F1** FUSIBLE PROTECCIÓN CONTROL ELECTRONICO / MANIOBRA 24V
*24V ELECTRONIC CONTROL FUSE*

**F2** FUSIBLE PROTECCIÓN VARIADOR DE VELOCIDAD VENTILADOR
*FAN SPEED CONTROLLER FUSE*

**FC** CONTROL DE FASES
*PHASE CONTROL*

**FS** CONTROL CAUDAL DE AGUA (UNIDADES TC)
*WATER FLOW SWITCH (TC UNITS)*

**FSC** VARIADOR VELOCIDAD VENTILADOR
*FAN SPEED CONTROLLER*

**HP** PRESOSTATO ALTA 41 BAR
*HIGH PRESSURE SWITCH, 41 BAR*

**HTP** PROTECTOR TÉRMICO RESISTENCIA
*HEATER THERMAL PROTECTION*

**K1** CONTACTOR COMPRESOR
*COMPRESSOR CONTACTOR*

**K2** CONTACTOR RESISTENCIA AUXILIAR
*AUXILIARY HEATER CONTACTOR*

**LAK** ACCESORIO LOW AMBIENT
KIT PRESOSTATICO
*LOW AMBIENT KIT, ACCESSORY*

**LP** PRESOSTATO BAJA 2,5 BAR
*LOW PRESSURE SWITCH, 2.5BAR*

**M1** COMPRESOR
*COMPRESSOR*

**M2** VENTILADOR 1
*FAN 1*

**M3** BOMBA (UNIDADES TC)
*PUMP (TC UNITS)*

**MS** INTERRUPTOR GENERAL
*MAIN SWITCH*

**Q1** PROTECTOR MAGNETOTÉRMICO RESISTENCIA APOYO
*BACKUP HEATER MAGNETO THERMAL PROTECTOR*

**Q2** PROTECTOR MAGNETOTÉRMICO GENERAL / COMPRESOR
*MAIN MAGNETO THERMAL PROTECTOR, COMPRESSOR*

**Q3** PROTECTOR MAGNETOTÉRMICO MANIOBRA GENERAL 230V / VENTILADOR / BOMBA / RESISTENCIA CARTER
*MAIN OPERATING MAGNETO THERMAL PROTECTOR, 220V/FAN/PUMP. SUMP HEATER*

**R00** SELECTOR REMOTO PARO / MARCHA
*ON/OFF REMOTE CONTROL*

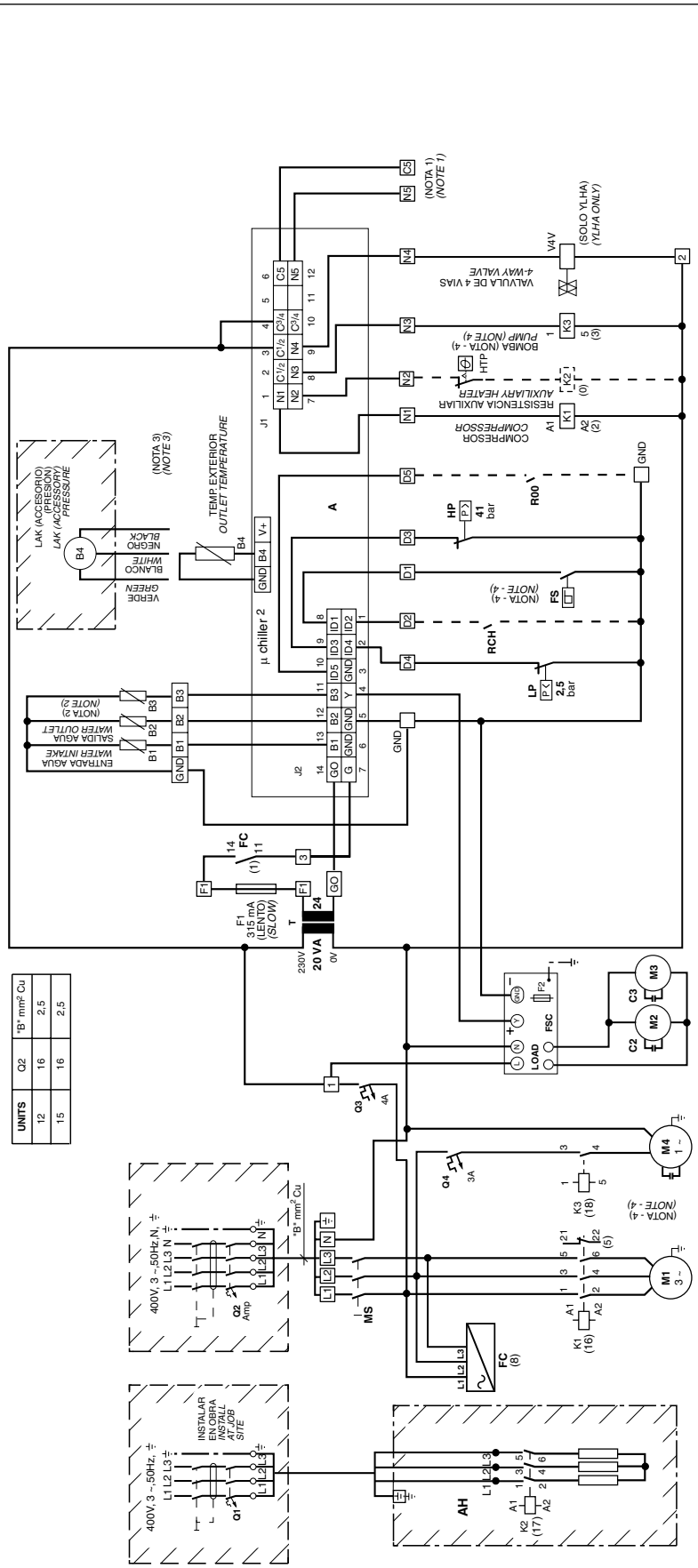
**RCH** SELECTOR REMOTO FRIO / CALOR
*COOL/HEAT REMOTE CONTROL*

**T** TRANSFORMADOR 230 / 24V 20VA
*230 / 24V 20VA TRANSFORMER*

**V4V** VALVULA DE 4 VIAS
*4-WAY VALVE*

I-2545g
YLCA/YLHA PLUS 7, 9 TC and T
400.3.50

# Wiring diagram, YLCA/YLHA PLUS 12 and 15 TC and T, 400.3.50

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**NOTAS:** ***NOTES:***

**1.-** ALARMA CONTACTO NORMALMENTE ABIERTO LIBRE DE TENSIÓN (3A.RESISTIVOS MAXIMO)
*ALARM.CONTACT NORMALLY OPEN, VOLT-FREE (3A. MAXIMUM RESISTANCE.)*

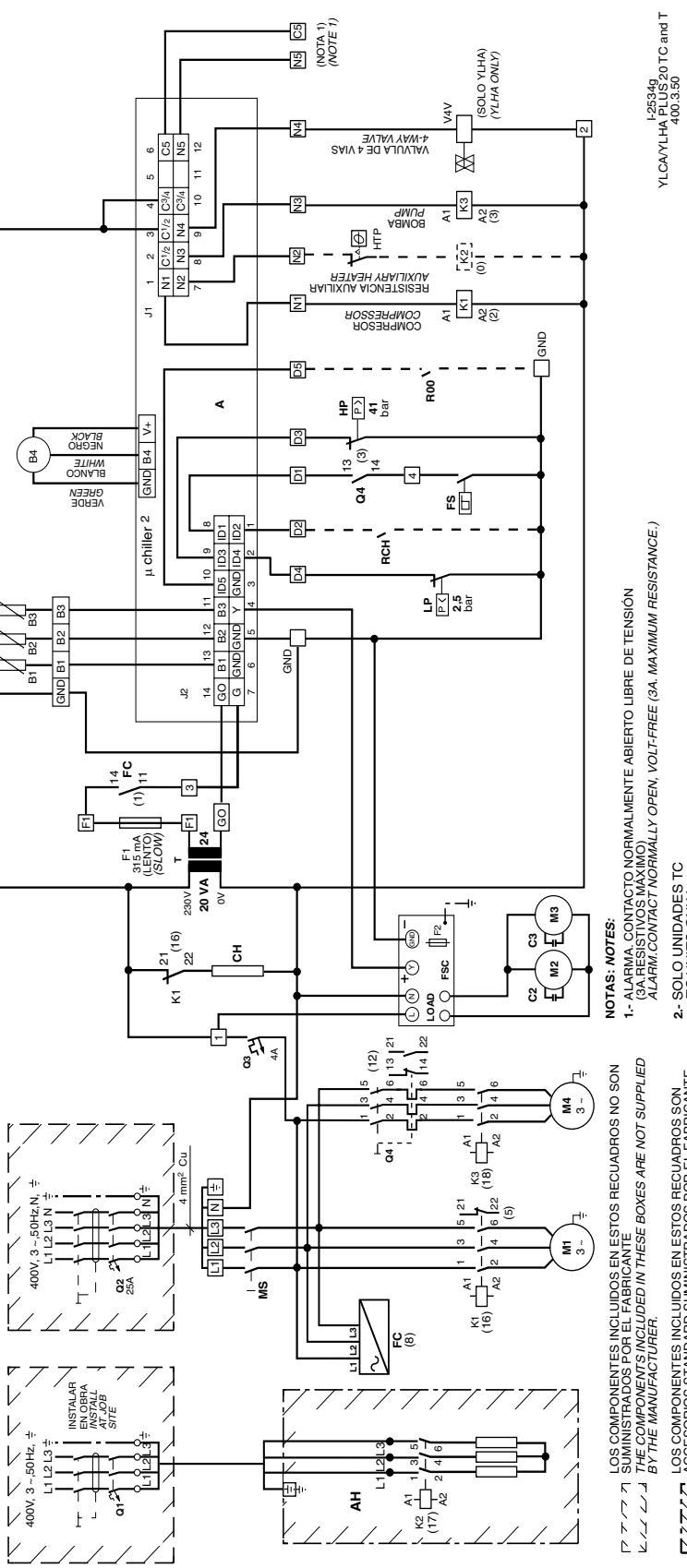
**2.-** SONDA TEMPERATURA EXTERIOR EN UNIDADES CON LAK (NTC)
SONDA TEMPERATURA BATERIA EN UNIDADES ESTANDARD (NTC)
*OUTDOOR TEMPERATURE PROBE ON UNITS WITH LAK (NTC)*
*COIL TEMPERATURE PROBE ON STANDARD UNITS (NTC)*

**3.-** TRANSDUCTOR DE PRESION RACIOMETRICO EN UNIDADES CON LAK
SONDA TEMPERATURA EXTERIOR EN UNIDADES ESTANDARD (NTC)
*RATIOMETRIC PRESSURE TRANSDUCER ON UNITS WITH LAK,*
*OUTDOOR TEMPERATURE PROBE ON STANDARD UNITS (NTC)*

**4.-** SOLO UNIDADES TC
*TC UNITS ONLY*

| | | | | | |
|---|---|---|---|---|---|
| **A** | CONTROL ELECTRÓNICO<br>*ELECTRONIC CONTROL* | **F1** | FUSIBLE PROTECCIÓN CONTROL ELECTRONICO / MANIOBRA 24V<br>*24V ELECTRONIC CONTROL FUSE* | **K1** | CONTACTOR COMPRESOR<br>*COMPRESSOR CONTACTOR* |
| **AH** | RESISTENCIA AUXILIAR<br>*AUXILIARY HEATER* | **F2** | FUSIBLE PROTECCIÓN VARIADOR DE VELOCIDAD VENTILADOR<br>*FAN SPEED CONTROLLER FUSE* | **K2** | CONTACTOR RESISTENCIA AUXILIAR<br>*AUXILIARY HEATER CONTACTOR* |
| **B1** | SONDA TEMPERATURA ENTRADA AGUA (NTC)<br>*WATER INTAKE TEMPERATURE PROBE (NTC)* | **FC** | CONTROL DE FASES<br>*PHASE CONTROL* | **K3** | CONTACTOR BOMBA (UNIDADES TC)<br>*PUMP CONTACTOR (TC UNITS)* |
| **B2** | SONDA TEMPERATURA SALIDA AGUA (NTC)<br>*WATER OUTLET TEMPERATURE PROBE (NTC)* | **FS** | CONTROL CAUDAL DE AGUA (UNIDADES TC)<br>*WATER FLOW SWITCH (TC UNITS)* | **LAK** | ACCESORIO LOW AMBIENT<br>KIT PRESOSTATICO<br>*LOW AMBIENT KIT, ACCESSORY* |
| **B3** | SONDA TEMPERATURA (VER NOTA 2) (NTC)<br>*TEMPERATURE PROBE (SEE NOTE 2) (NTC)* | **FSC** | VARIADOR VELOCIDAD VENTILADOR<br>*FAN SPEED CONTROLLER* | **LP** | PRESOSTATO BAJA 2,5 BAR<br>*LOW PRESSURE SWITCH, 2.5BAR* |
| **B4** | (VER NOTA 3)<br>*(SEE NOTE 3)* | **HP** | PRESOSTATO ALTA 41 BAR<br>*HIGH PRESSURE SWITCH, 41 BAR* | **M1** | COMPRESOR<br>*COMPRESSOR* |
| **C2, C3** | CONDENSADOR VENTILADOR<br>*FAN CONDENSER* | **HTP** | PROTECTOR TÉRMICO RESISTENCIA<br>*HEATER THERMAL PROTECTION* | **M2** | VENTILADOR 1<br>*FAN 1* |
| | | | | **M3** | VENTILADOR 2<br>*FAN 2* |
| | | | | **M4** | BOMBA (UNIDADES TC)<br>*PUMP (TC UNITS)* |
| | | | | **MS** | INTERRUPTOR GENERAL<br>*MAIN SWITCH* |
| | | | | **Q1** | PROTECTOR MAGNETOTÉRMICO RESISTENCIA APOYO<br>*BACKUP HEATER MAGNETO THERMAL PROTECTOR* |
| | | | | **Q2** | PROTECTOR MAGNETOTÉRMICO GENERAL / COMPRESOR<br>*MAIN MAGNETO THERMAL PROTECTOR, COMPRESSOR* |
| | | | | **Q3** | PROTECTOR MAGNETOTÉRMICO MANIOBRA GENERAL 230V / VENTILADOR / BOMBA / RESISTENCIA CARTER<br>*MAIN OPERATING MAGNETO THERMAL PROTECTOR, 220V/FAN/PUMP. SUMP HEATER* |
| | | | | **Q4** | PROTECTOR MAGNETOTÉRMICO BOMBA (UNIDADES TC)<br>*PUMP MAGNETO THERMAL PROTECTOR (TC UNITS)* |
| | | | | **R00** | SELECTOR REMOTO PARO / MARCHA<br>*ON/OFF REMOTE CONTROL* |
| | | | | **RCH** | SELECTOR REMOTO FRIO / CALOR<br>*COOL/HEAT REMOTE CONTROL* |
| | | | | **T** | TRANSFORMADOR 230 / 24V 20VA<br>*230 / 24V 20VA TRANSFORMER* |
| | | | | **V4V** | VALVULA DE 4 VIAS<br>*4-WAY VALVE* |

# Wiring diagram, YLCA/YLHA PLUS 20 TC and T 400.3.50




I-2534g
YLCA/YLHA PLUS 20 TC and T 400.3.50

LOS COMPONENTES INCLUIDOS EN ESTOS RECUADROS NO SON SUMINISTRADOS POR EL FABRICANTE
*THE COMPONENTS INCLUDED IN THESE BOXES ARE NOT SUPPLIED BY THE MANUFACTURER.*

LOS COMPONENTES INCLUIDOS EN ESTOS RECUADROS SON ACCESORIOS STANDARD SUMINISTRADOS POR EL FABRICANTE
*THE COMPONENTS INCLUDED IN THESE BOXES ARE STANDARD ACCESSORIES SUPPLIED BY THE MANUFACTURER.*

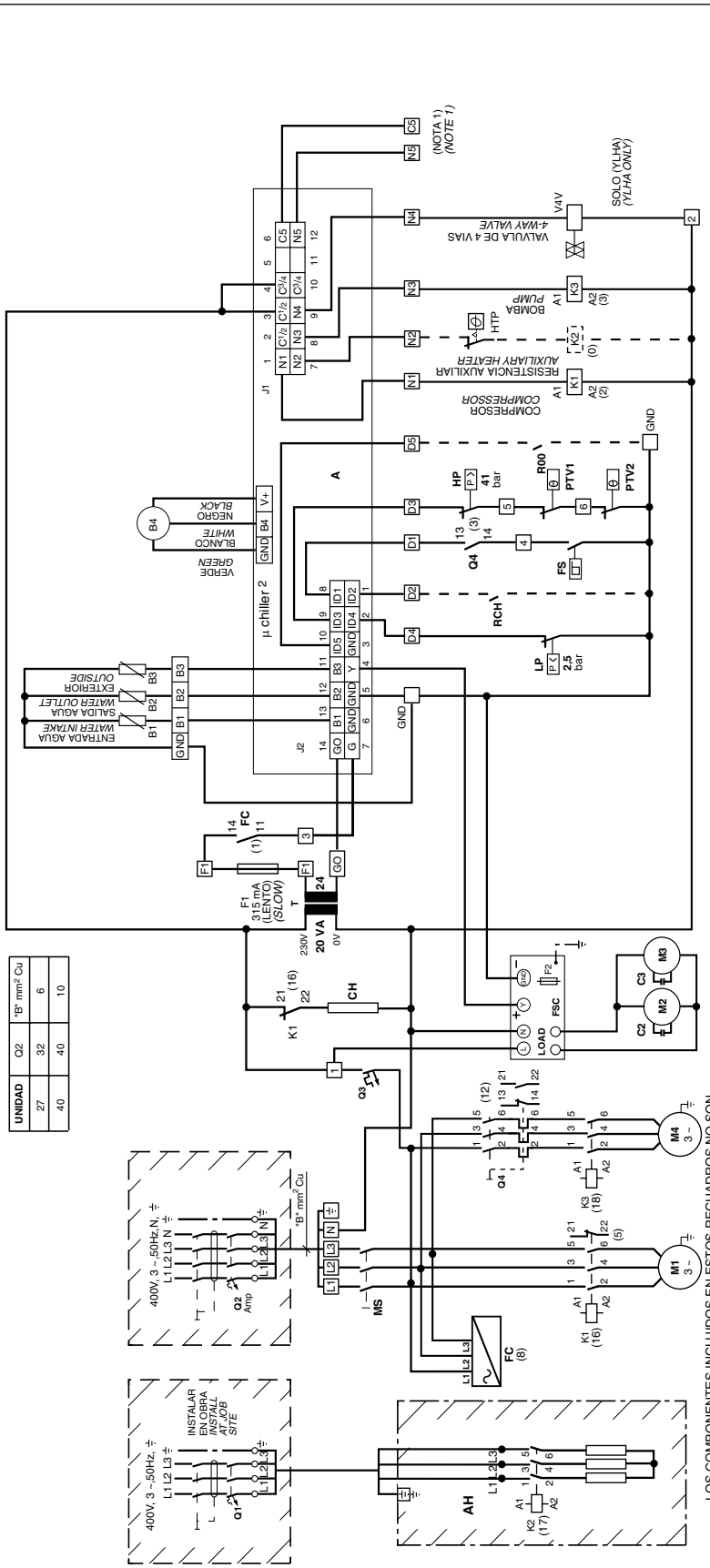
**NOTAS: *NOTES:***

**1.-** ALARMA, CONTACTO NORMALMENTE ABIERTO LIBRE DE TENSIÓN (3A.RESISTIVOS MÁXIMO)
*ALARM CONTACT NORMALLY OPEN, VOLT-FREE (3A. MAXIMUM RESISTANCE.)*

**2.-** SOLO UNIDADES TC
*TC UNITS ONLY*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **A** | CONTROL ELECTRÓNICO<br>*ELECTRONIC CONTROL* | **C2, C3** | CONDENSADOR VENTILADOR<br>*FAN CONDENSER* | **HP** | PRESOSTATO ALTA 41 BAR<br>*HIGH PRESSURE SWITCH, 41 BAR* | **M2** | VENTILADOR 1<br>*FAN 1* |
| **AH** | RESISTENCIA AUXILIAR<br>*AUXILIARY HEATER* | **CH** | RESISTENCIA CARTER COMPRESOR<br>*COMPRESSOR SUMP HEATER* | **HTP** | PROTECTOR TÉRMICO RESISTENCIA<br>*HEATER THERMAL PROTECTION* | **M3** | VENTILADOR 2<br>*FAN 2* |
| **B1** | SONDA TEMPERATURA ENTRADA AGUA (NTC)<br>*WATER INTAKE TEMPERATURE PROBE (NTC)* | **F1** | FUSIBLE PROTECCIÓN CONTROL ELECTRONICO / MANIOBRA 24V<br>*24V ELECTRONIC CONTROL FUSE* | **K1** | CONTACTOR COMPRESOR<br>*COMPRESSOR CONTACTOR* | **M4** | BOMBA (UNIDADES TC)<br>*PUMP (TC UNITS)* |
| **B2** | SONDA TEMPERATURA SALIDA AGUA (NTC)<br>*WATER OUTLET TEMPERATURE PROBE (NTC)* | **F2** | FUSIBLE PROTECCIÓN VARIADOR DE VELOCIDAD VENTILADOR<br>*FAN SPEED CONTROLLER FUSE* | **K2** | CONTACTOR RESISTENCIA AUXILIAR<br>*AUXILIARY HEATER CONTACTOR* | **MS** | INTERRUPTOR GENERAL<br>*MAIN SWITCH* |
| **B3** | SONDA TEMPERATURA EXTERIOR (NTC)<br>*OUTSIDE TEMPERATURE PROBE (NTC)* | **FC** | CONTROL DE FASES<br>*PHASE CONTROL* | **K3** | CONTACTOR BOMBA (UNIDADES TC)<br>*PUMP CONTACTOR (TC UNITS)* | **Q1** | PROTECTOR MAGNETOTÉRMICO RESISTENCIA APOYO<br>*BACKUP HEATER MAGNETO THERMAL PROTECTOR* |
| **B4** | SONDA DE PRESIÓN RACIOMÉTRICA CONTROL VELOCIDAD VENTILADORES/ DESCARCHE<br>*RATIOMETRIC PRESSURE PROBE FAN SPEED CONTROL DEFROSTS (ACCESSORY)* | **FS** | CONTROL CAUDAL DE AGUA (UNIDADES TC)<br>*WATER FLOW SWITCH (TC UNITS)* | **LAK** | ACCESORIO LOW AMBIENT KIT PRESOSTATICO<br>*LOW AMBIENT KIT, ACCESSORY* | **Q2** | PROTECTOR MAGNETOTÉRMICO GENERAL / COMPRESOR<br>*MAIN MAGNETO THERMAL PROTECTOR, COMPRESSOR* |
| | | **FSC** | VARIADOR VELOCIDAD VENTILADOR<br>*FAN SPEED CONTROLLER* | **LP** | PRESOSTATO BAJA 2,5 BAR<br>*LOW PRESSURE SWITCH, 2.5BAR* | **Q3** | PROTECTOR MAGNETOTÉRMICO MANIOBRA GENERAL 230V / VENTILADOR / BOMBA / RESISTENCIA CARTER<br>*MAIN MAGNETO THERMAL PROTECTOR, 230V/FAN/PUMP. S UMP HEATER* |
| | | | | **M1** | COMPRESOR<br>*COMPRESSOR* | **Q4** | PROTECTOR MAGNETOTÉRMICO BOMBA (UNIDADES TC)<br>*PUMP MAGNETO THERMAL PROTECTOR (TC UNITS)* |
| | | | | | | **R00** | SELECTOR REMOTO PARO / MARCHA<br>*ON/OFF REMOTE CONTROL* |
| | | | | | | **RCH** | SELECTOR REMOTO FRIO / CALOR<br>*COOL/HEAT REMOTE CONTROL* |
| | | | | | | **T** | TRANSFORMADOR 230 / 24V 20VA<br>*230 / 24V 20VA TRANSFORMER* |
| | | | | | | **V4V** | VALVULA DE 4 VIAS<br>*4-WAY VALVE* |

# Wiring diagram, YLCA 27 TC, YLHA PLUS 27 TC, 400.3.50




**A** CONTROL ELECTRÓNICO
*ELECTRONIC CONTROL*

**AH** RESISTENCIA AUXILIAR
*AUXILIARY HEATER*

**B1** SONDA TEMPERATURA ENTRADA AGUA (NTC)
*WATER INTAKE TEMPERATURE PROBE (NTC)*

**B2** SONDA TEMPERATURA SALIDA AGUA (NTC)
*WATER OUTLET TEMPERATURE PROBE (NTC)*

**B3** SONDA TEMPERATURA EXTERIOR (NTC)
*OUTSIDE TEMPERATURE PROBE (NTC)*

**B4** SONDA DE PRESIÓN RACIOMÉTRICA CONTROL VELOCIDAD VENTILADORES/ DESESCARCHES
*RATIOMETRIC PRESSURE PROBE FAN SPEED CONTROL DEFROSTS (ACCESSORY)*

**C2, C3** CONDENSADOR VENTILADOR
*FAN CONDENSER*

**CH** RESISTENCIA CARTER COMPRESOR
*COMPRESSOR SUMP HEATER*

**F1** FUSIBLE PROTECCIÓN CONTROL ELECTRONICO / MANIOBRA 24V
*24V ELECTRONIC CONTROL FUSE*

**F2** FUSIBLE PROTECCIÓN VARIADOR DE VELOCIDAD VENTILADOR
*FAN SPEED CONTROLLER FUSE*

**FC** CONTROL DE FASES
*PHASE CONTROL*

**FS** CONTROL CAUDAL DE AGUA (UNIDADES TC)
*WATER FLOW SWITCH (TC UNITS)*

**FSC** VARIADOR VELOCIDAD VENTILADOR
*FAN SPEED CONTROLLER*

**HP** PRESOSTATO ALTA 41 BAR
*HIGH PRESSURE SWITCH, 41 BAR*

**HTP** PROTECTOR TÉRMICO RESISTENCIA
*HEATER THERMAL PROTECTION*

**K1** CONTACTOR COMPRESOR
*COMPRESSOR CONTACTOR*

**K2** CONTACTOR RESISTENCIA AUXILIAR
*AUXILIARY HEATER CONTACTOR*

**K3** CONTACTOR BOMBA (UNIDADES TC)
*PUMP CONTACTOR (TC UNITS)*

**LAK** ACCESORIO LOW AMBIENT
KIT PRESOSTATICO
*LOW AMBIENT KIT. ACCESSORY*

**LP** PRESOSTATO BAJA 2,5 BAR
*LOW PRESSURE SWITCH, 2.5 BAR*

**M1** COMPRESOR
*COMPRESSOR*

**M2** VENTILADOR 1
*FAN 1*

**M3** VENTILADOR 2
*FAN 2*

**M4** BOMBA (UNIDADES TC)
*PUMP (TC UNITS)*

**MS** INTERRUPTOR GENERAL
*MAIN SWITCH*

**PTV1 /PTV2** PROTECTOR TÉRMICO VENTILADOR
*FAN HEAT SWITCH*

**Q1** PROTECTOR MAGNETOTÉRMICO RESISTENCIA APOYO
*BACKUP HEATER MAGNETO THERMAL PROTECTOR*

**Q2** PROTECTOR MAGNETOTÉRMICO GENERAL COMPRESOR
*MAIN MAGNETO THERMAL PROTECTOR, COMPRESSOR*

**Q3** PROTECTOR MAGNETOTÉRMICO MANIOBRA GENERAL 230V / VENTILADOR / BOMBA / RESISTENCIA CARTER
*MAIN MAGNETO THERMAL PROTECTOR, 220V/FAN/PUMP. SUMP HEATER*
YLCA/YLHA 27 : 4A
YLCA/YLHA 40 : 6A

**Q4** PROTECTOR MAGNETOTÉRMICO BOMBA (UNIDADES TC)
*UMP MAGNETO THERMAL PROTECTOR (TC UNITS)*

**R00** SELECTOR REMOTO PARO / MARCHA
*ON/OFF REMOTE CONTROL*

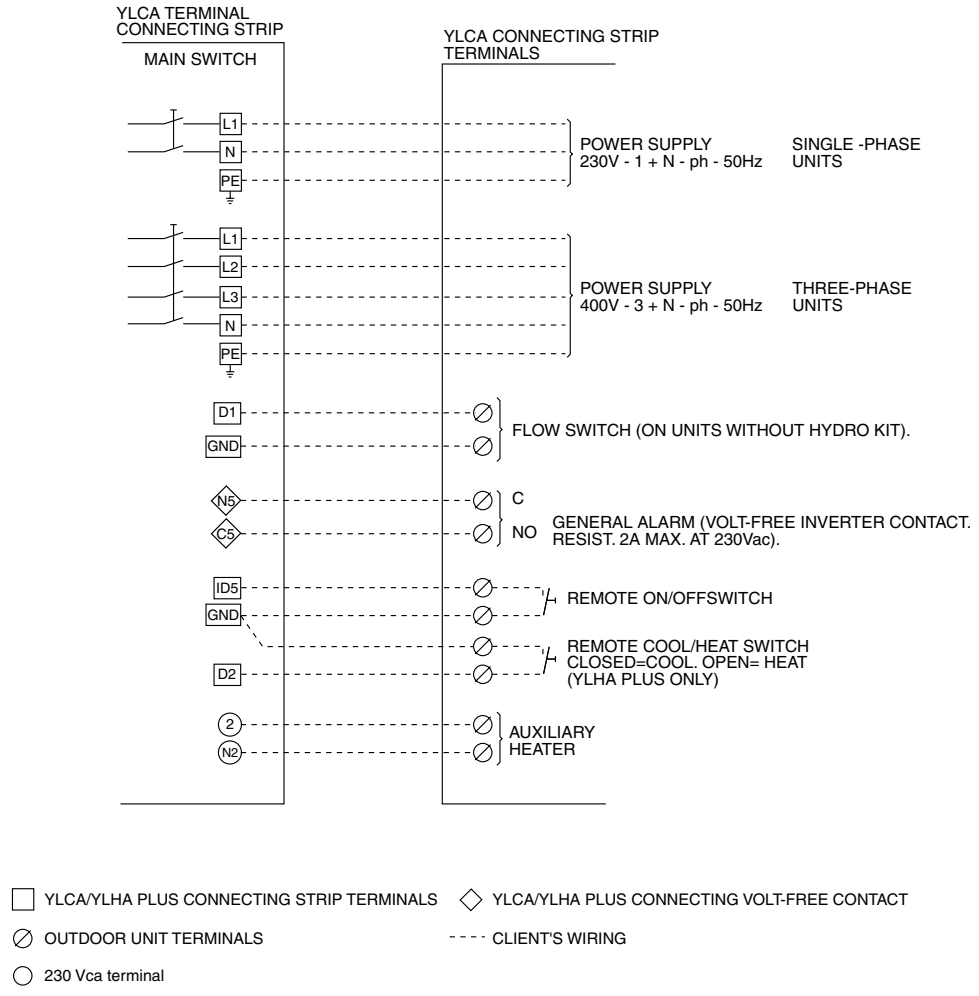
**RCH** SELECTOR REMOTO FRIO / CALOR
*COOL/HEAT REMOTE CONTROL*

**T** TRANSFORMADOR 230 / 24V 20VA
*230 / 24V 20VA TRANSFORMER*

**V4V** VALVULA DE 4 VIAS
*4-WAY VALVE*

## Wiring

### YLCA/YLHA PLUS 5 to 27



## Electrical characteristics

| Model | Power supply V.ph.Hz. | Compressor | | | | | Fans | | Pump | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Nominal A | | Start | Nominal kW | | Nominal | Nominal | Nominal | Nominal |
| | | Cool | Heat | A | Cool | Heat | A | W | A | W |
| **YLCA 5** | 230.1.50 | 7.8 | - | 60 | 1.73 | - | 0.6 | 140 | 0.65 | 160 |
| **YLHA PLUS 5** | | 7.8 | 8.1 | | 1.73 | 1.76 | | | | |
| **YLCA 7** | | 11.7 | - | 82 | 2.41 | - | 0.8 | 170 | 0.95 | 210 |
| **YLHA PLUS 7** | | 12.4 | 13.2 | | 2.56 | 2.76 | | | | |
| **YLCA 9** | | 17 | - | 97 | 3.40 | - | | | | |
| **YLHA PLUS 9** | | 17 | 14.5 | | 3.26 | 3.06 | | | | |
| **YLCA 7** | 400.3.50 | 3.9 | - | 35 | 2.41 | - | | | | |
| **YLHA PLUS 7** | | 4.1 | 4.8 | | 2.56 | 2.76 | | | | |
| **YLCA 9** | | 5.7 | - | 48 | 3.16 | - | | | | |
| **YLHA PLUS 9** | | 6 | 5.8 | | 3.26 | 3.06 | | | | |
| **YLCA 12** | | 6.36 | - | 51 | 3.80 | - | 2 x 0.87 | 2 x 185 | 1.8 | 400 |
| **YLHA PLUS 12** | | 6.36 | 6.38 | | 3.80 | 3.77 | | | | |
| **YLCA 15** | | 8.9 | - | 74 | 5.38 | - | | | 2.15 | 490 |
| **YLHA PLUS 15** | | 8.7 | 8.9 | | 5.25 | 5.23 | | | | |
| **YLCA 20** | | 13 | - | 95 | 6.65 | - | 2 x 0.8 | 2 x 170 | 1.1 | 390 |
| **YLHA PLUS 20** | | 12.2 | 11.7 | | 6.62 | 6.26 | | | | |
| **YLCA 27** | | 16.7 | - | 118 | 8.73 | - | 2 x 0.85 | 2 x 175 | 1.34 | 755 |
| **YLHA PLUS 27** | | 16.7 | 16 | | 8.73 | 8.24 | | | | |

## Limits of use

| Model | Voltage limits | | Entering air temperature to coil DB | | | | Water output temperature | | | | Temperature dif. between water output and intake | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal 400 | | Operating cycle | | | | Operating cycle | | | | | |
| | | | Minimum °C | | Maximum °C | | Minimum °C | | Maximum °C | | Minimum °C | Maximum °C |
| | Minimum | Maximum | Cool | Heat | Cool | Heat | Cool | Heat | Cool | Heat | | |
| **YLCA** | 342 | 436 | -10 (2) | - | 46 | - | 5 (1) | - | 15 | - | 3 | 7 |
| **YLHA PLUS** | | | | -10 | | 20 | | 30 | | 50 (3) | | |

(1) At lower water temperatures, it is advisable to use glycol type antifreeze mixtures. Minimum Temperature with glycol -5° C. (2) -18°C with low temperature kit (optional) on models YLCA/YLHA PLUS 5 to 20, and standard on models YLCA/YLHA PLUS 20, 27. (3) 50°C if entering air temperature is above 0°C.

## Prior to final approval of the installation

**Check:**
- Voltage is always between 342 - 436 V.
- Power supply cable section is, at least, as indicated on the corresponding wiring diagrams.

- The warrantee card has been filled out.

- Maintenance instructions have been given, or a regular maintenance contract has been signed.
- Operating instructions have been given to the user.

# Operating instructions µC2 (Rev. 1016)

## Control unit description

This is a multipurpose controller specially programmed for use with air-water chillers and heat pumps equipped with a compressor with one single power stage.

**Main functions**

- Water temperature control (at intake or outlet, as per parameter r6).
- Defrost cycle management.
- System operating and safety management.
- Fan speed control.
- Alarm management.
- Connection for supervision and telephone assistance (access serial connection RS485).

**Devices controlled**

- Compressor
- Fans
- Four-way valve
- Water pump
- Alarm device
- Auxiliary heater

## Standard components

- ***Control module.*** This is the central nucleus that processes the signals coming from the probes and protection elements of the entire system to control its active elements: compressor and fans, four-way valve, water circulating pump, alarm relay and auxiliary heater. Power supply 24 Vac.

  Can also be used for access and control of the system by means of the display, buttons and LEDs available. Allows selection cool, heat and off functions. Operating parameters can also be modified, and the system can be supervised as well.

- ***Fan speed control module.*** Operates by phase cut-off. Includes fuse.

- ***NTC and ratiometric (pressure) probes.***
  *YLCA/YLHA PLUS 5 to 15 standard.*
  4 NTC probes are used to read system temperatures:
  B1. Controls set point. Reads water temperature at exchanger intake.
  B2. Antifreeze control. Reads water temperature at exchanger discharge.
  B3. Fan speed and defrost cycle control. Reads refrigerant temperature inside the coil.
  B4. Dynamic set point control. Reads outdoor air temperature.

  *YLHA PLUS, YLCA 20, 27 and YLCA 5-15 LAK (low temperature kit).*
  3 NTC probes are used to read system temperatures and a ratiometric pressure transducer (B4) to read refrigerant pressure inside the coil:
  B1. Controls set point. Reads water temperature at exchanger intake.
  B2. Antifreeze control. Reads water temperature at exchanger discharge.
  B3. Controls dynamic set point. Reads outdoor air temperature.
  B4. Fan speed and defrost cycle control. Reads refrigerant pressure inside the coil.

**Parameters**

The set of parameters that configure the operating program of the unit is divided into four levels (*Factory, Super User, User* and *Direct*), depending upon the function of each parameter and the user's access level. The parameters of each level can be modified from that same level, as well as lower level parameters.

***Factory* level**

Accessible with the *Factory password.* Allows configuration of all unit parameters.

***Super User* level**

Accessible with *Super User password*. Allows setting *Super User, User* and *Direct* parameters.

***User* level**

Accessible with *password 22*. Allows access to all parameters the user normally sets.

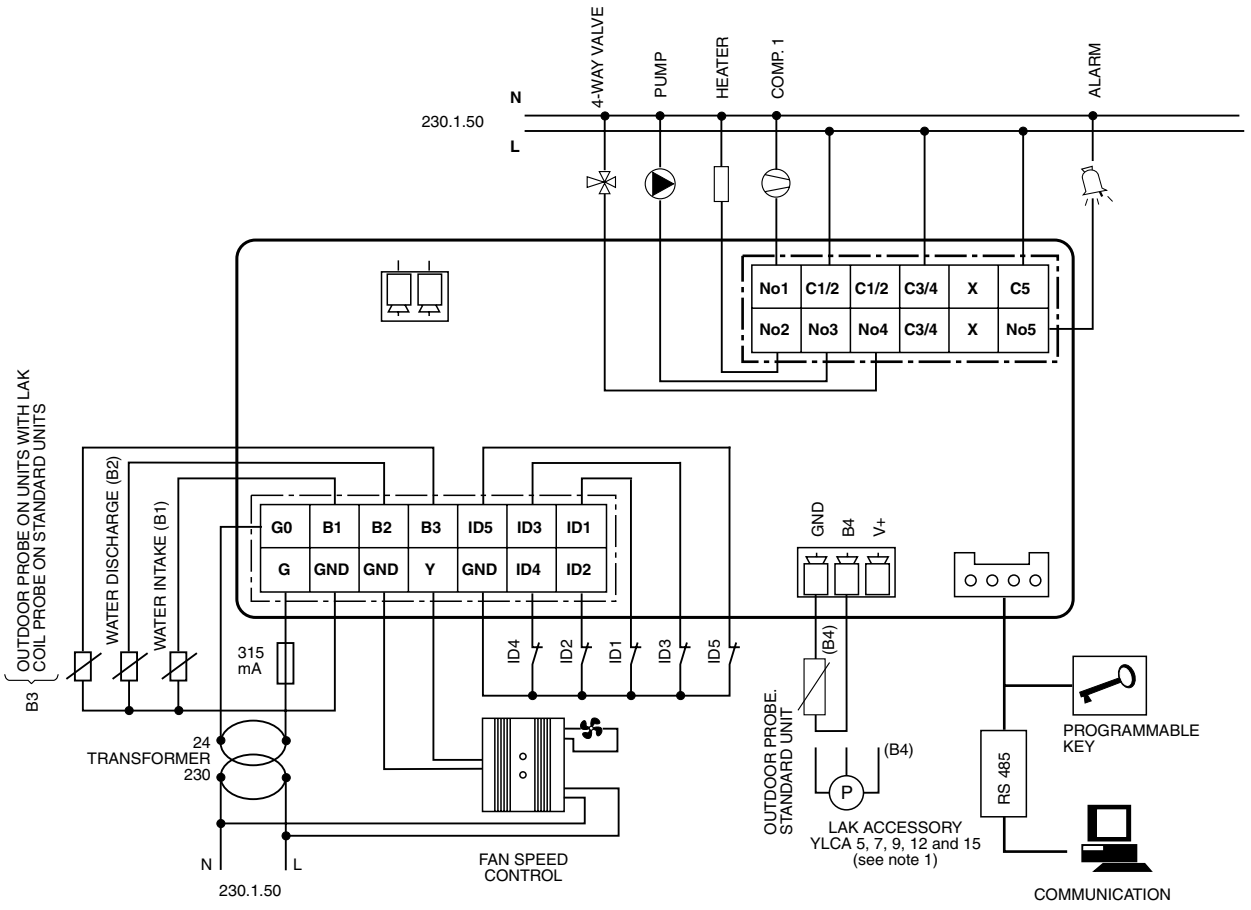
***Direct* level**

Accessible without a *password*. Allows reading the values detected by the probes, as well as other system values. Can be used by the user without affecting unit operation.

**General**

Modification of the parameters that affect basic unit configuration should be made with the controller in *Standby* position.

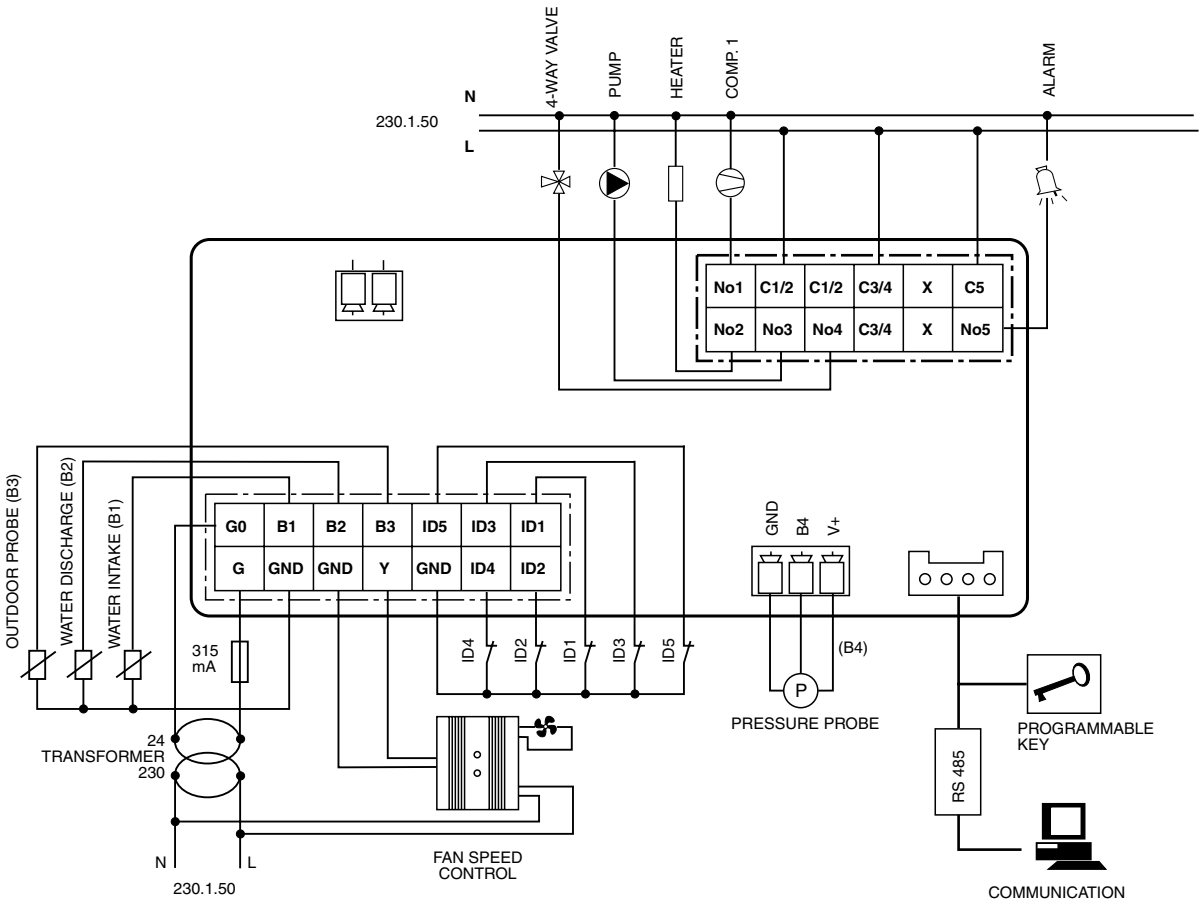
## General diagram, YLCA 5, 7, 9, 12 and 15




B1: WATER INTAKE TEMPERATURE PROBE (SET POINT CONTROL)
B2: WATER DISCHARGE TEMPERATURE PROBE (ANTIFREEZE PROTECTION)
B3: COIL TEMPERATURE PROBE (FAN SPEED AND DEFROST CONTROL)
B4: OUTDOOR TEMPERATURE PROBE (DYNAMIC SET POINT)
ID1: WATER FLOW SWITCH
ID2: REMOTE COOL/HEAT
ID3: HIGH PRESSURE SWITCH
ID4: LOW PRESSURE SWITCH
ID5: REMOTE ON/OFF

NOTE 1.- WHEN THE LOW AMBIENT KIT IS INSTALLED. THE B4 PROBE MUST BE CONFIGURED AS A PRESSURE TRANSDUCER. AND B3 AS AN OUTDOOR TEMPERATURE NTC PROBE.

## General diagram, YLCA 20,27 and YLHA PLUS 5-27

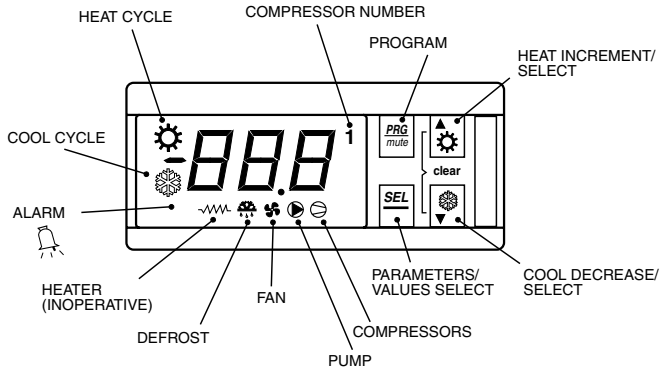



B1: WATER INTAKE TEMPERATURE PROBE (SET POINT CONTROL)
B2: WATER DISCHARGE TEMPERATURE PROBE (ANTIFREEZE PROTECTION)
B3: COIL TEMPERATURE PROBE FAN SPEED AND DEFROST CONTROL)
B4: OUTDOOR TEMPERATURE PROBE (DYNAMIC SET POINT)
ID1: WATER FLOW SWITCH
ID2: REMOTE COOL/HEAT
ID3: HIGH PRESSURE SWITCH
ID4: LOW PRESURE SWITCH
ID5: REMOTE ON/OFF

## Symbols on the display

The display has three figures in green, plus a symbol and a decimal. It also shows the symbols, in amber, of the functions selected (the alarm symbol is red).

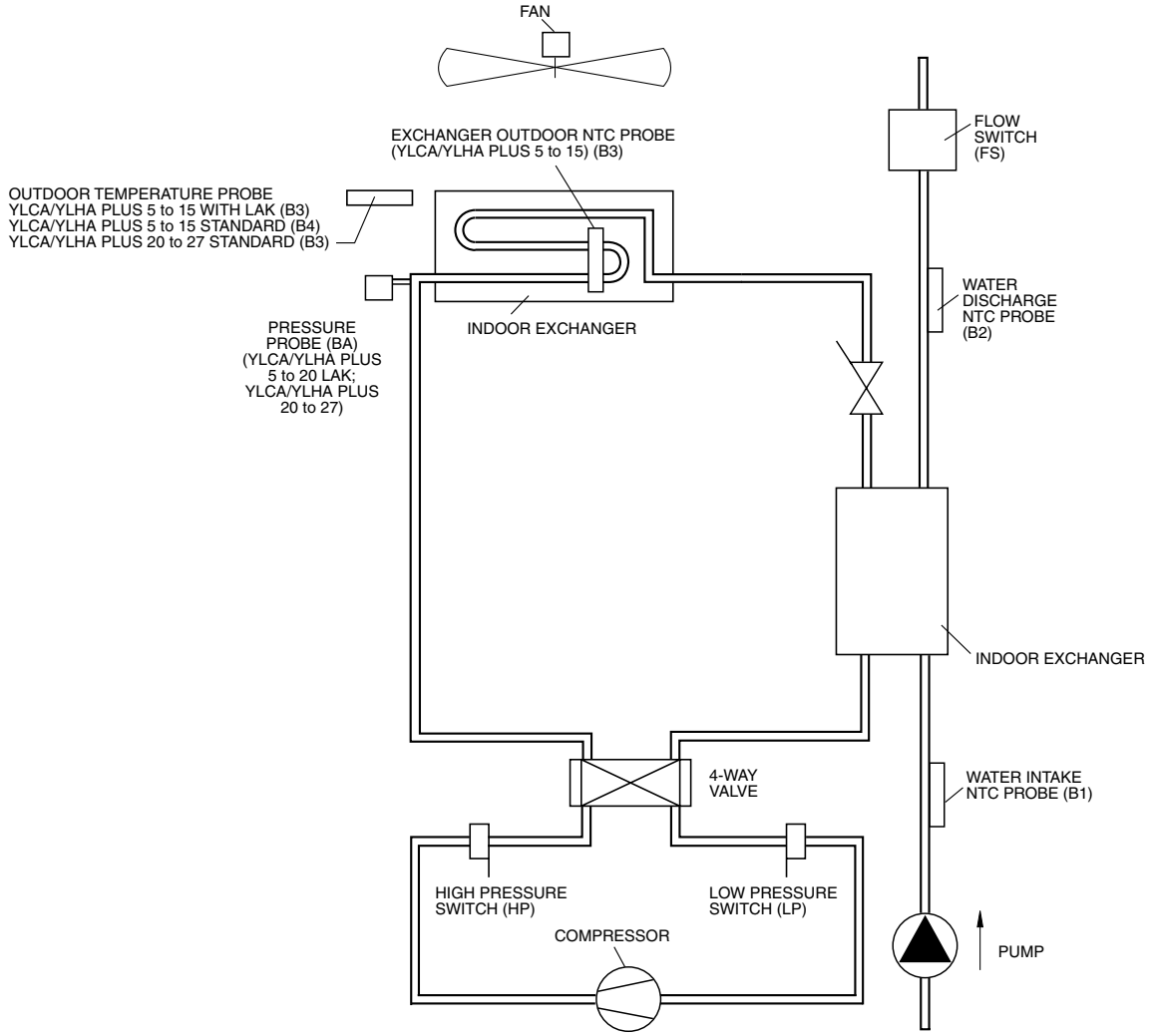
| Symbol | Colour | Meaning | |
|---|---|---|---|
| | | With LED on permanently | With LED flashing |
| 1 | Amber | Compressor in operation | Timing start-up |
| | | Compressors under call | - |
| | | Water pump in operation | - |
| | | Fans in operation | - |
| | | Defrost active | - |
| | Red | Alarm active | - |
| | Amber | Cool cycle | - |
| | | Heat cycle | - |




## Functions of remote control unit buttons

| BUTTON | UNIT STATUS | PRESSING |
|---|---|---|
| **Prg/mute** | Loads values by default | Applies voltage when pressed |
| | Return to superior sub-group within programming area until output of same (except changes in E2PROM) | Simply press |
| **Sel** | Access to *Direct* parameters | Press 5 seconds |
| | Selects a *Direct* parameter and shows its value / Confirms parameter changes | Simply press |
| **Prg+Sel** | Programming parameters with password | Press 5 seconds |
| ▲ | Selects superior parameter within the programming area | Simply press or continuous |
| | Increase value | Simply press or continuous |
| | Selects heat function from standby position and vice-versa (P6=1) | Press 5 seconds |
| ▼ | Selects lower parameter within programming area | Simply press or continuous |
| | Lower value | Simply press or continuous |
| | Selects cool function from standby position and vice-versa (P6=1) | Press 5 seconds |
| ▲ + ▼ | Manual alarm reset | Press 5 seconds |
| | Clears hour counters (within programming area) | Press 5 seconds |
| **SEL +** | Forced manual defrost | Press 5 seconds |

## Location of controls




## Parameter tables

The following tables show the parameters and their values divided into groups.

**Parameter level codes**

D = *Direct*
U = *User*
S = *Super User*
F = *Factory*

**Variables for supervision (VS)**

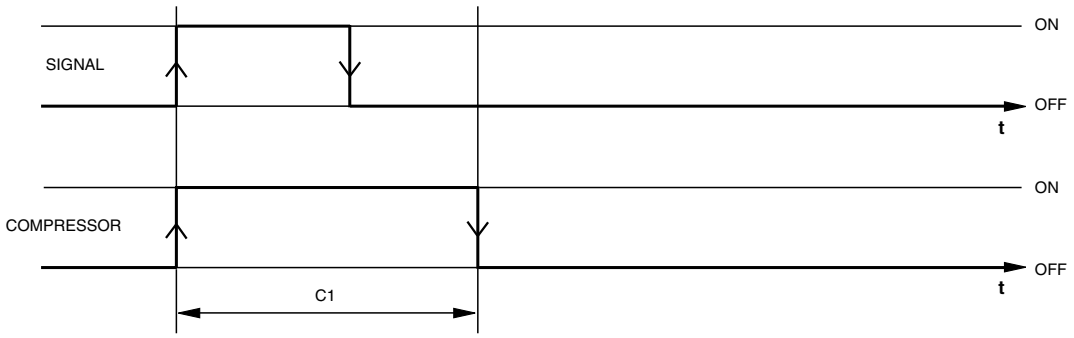
R/W = Read/write parameter
R = Read only parameter

| Parameters related to the probes | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Display** | **Description** | **Level** | **VS** | **Unit** | **Max.** | **Min.** | **Value** |
| **/01** | NTC B1 probe (water intake); 0=absent (function not available). 1=present | F | 1 (R/W) | - | 1 | 0 | **1** |
| **/02** | NTC B2 probe (water outlet). 0=absent (function not available). 1=present | F | 2 (R/W) | - | 1 | 0 | **1** |
| **/03** | NTC B3 probe . 1=condensation probe. 2=outdoor probe. | F | 14 (R/W) | - | 1 | 0 | **(a)** |
| **/04** | Probe type B4. 0=absent. 1=ON/OFF. 2=outdoor NTC probe. 3=ratio-metric 5Vdc. | F | 15 (R/W) | - | 3 | 0 | **(b)** |
| **/09** | Minimum input voltage | F | 18 (R/W) | 0.01 Vdc | /10 | 0 | **50** |
| **/10** | Maximum input voltage | F | 19 (R/W) | 0.01 Vdc | 500 | /09 | **450** |
| **/11** | Minimum pressure | F | 1 (R/W) | bar | /12 | 0 | **0** |
| **/12** | Maximum pressure | F | 2 (R/W) | bar | 99.9 | /11 | **45** |
| **/13** | Calibration probe B1 | F | 3 (R/W) | °C | 12 | -12 | **0** |
| **/14** | Calibration probe B2 | F | 4 (R/W) | °C | 12 | -12 | **0** |
| **/15** | Calibration probe B3 | F | 5 (R/W) | °C | 12 | -12 | **0** |
| **/16** | Calibration probe B4 | F | 6 (R/W) | bar | 12 | -12 | **0** |
| **/21** | Digital filter | U | 20 (R/W) | - | 15 | 1 | **4** |
| **/22** | Input limitation | U | 21 (R/W) | - | 15 | 1 | **8** |
| **/23** | Measuring unit 0 = C; 1 = 1F | U | 5 (R/W) | - | 1 | 0 | **0** |
| **b00** | Probe viewed on display | U | 24 (R/W) | - | 7 | 0 | **0** |
| **b01** | Value read by probe B1 | D | 70 (R) | °C | - | - | **-** |
| **b02** | Value read by probe B2 | D | 71 (R) | °C | - | - | **-** |
| **b03** | Value read by probe B3 | D | 72 (R) | °C | - | - | **-** |
| **b04** | Value read by probe B4 | D | 73 (R) | °C/bar | - | - | **-** |

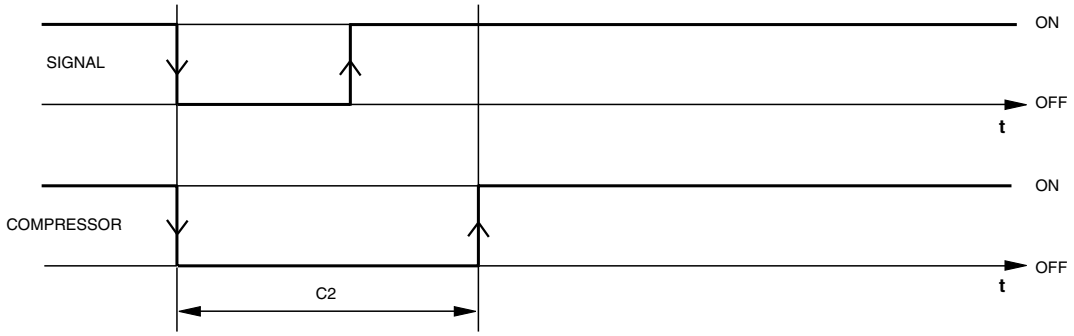
(a) YLCA/YLHA PLUS 5 to 15 /03=1; YLCA/YLHA PLUS 5 to 15 LAK 03/=2; YLCA/YLHA PLUS 20 to 27 03/=2.
(b) YLCA/YLHA PLUS 5 to 15 /04=2; YLCA/YLHA PLUS 5 to 15 LAK 04/=3. YLCA/YLHA PLUS 20 to 27 04/=3.

| Parameters related to the probes | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Display** | **Description** | **Level** | **VS** | **Unit** | **Max** | **Min** | **Value** |
| **c01** | Minimum operating time | U | 25 (R/W) | Sec. | 999 | 0 | **60** |
| **c02** | Minimum OFF time | U | 26 (R/W) | Sec. | 999 | 0 | **60** |
| **c03** | Time between start-ups of the same compressor | U | 27 (R/W) | Sec. | 999 | 0 | **300** |
| **c06** | Start-up timed | U | 30 (R/W) | Sec. | 999 | 0 | **10** |
| **c07** | Compressor start-up delay with regard to the pump | U | 31 (R/W) | Sec. | 150 | 0 | **20** |
| **c08** | Pump OFF delay with regard to the compressor | U | 32 (R/W) | Min. | 150 | 0 | **1** |
| **c10** | Operating hour counter compressor | D | 90 (R) | Hours | 800 | 0 | - |
| **c14** | Operating hour counter for compressor maintenance | U | 34 (R/W) | Hours | 100 | 0 | **0** |
| **c15** | Operating hour counter for pump | D | 94 (R/W) | Hours | 800 | 0 | - |
| **c17** | Minimum time between pump start-ups | U | 35 (R/W) | Min. | 150 | 0 | **5** |
| **c18** | Minimum operating time for pump | U | 36 (R/W) | Min. | 15 | 0 | **1** |

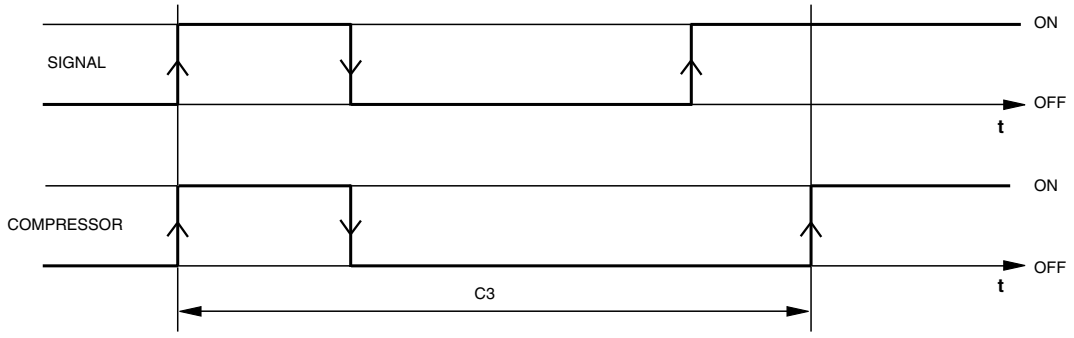
**Minimum operating time of a compressor**



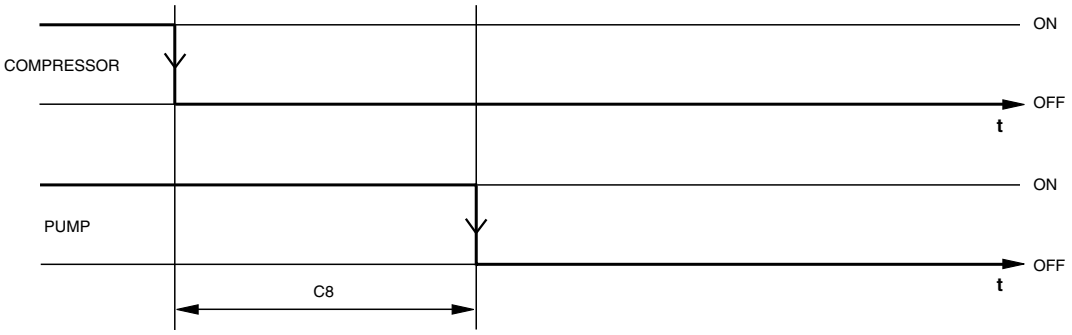

**Minimum OFF time of a compressor**



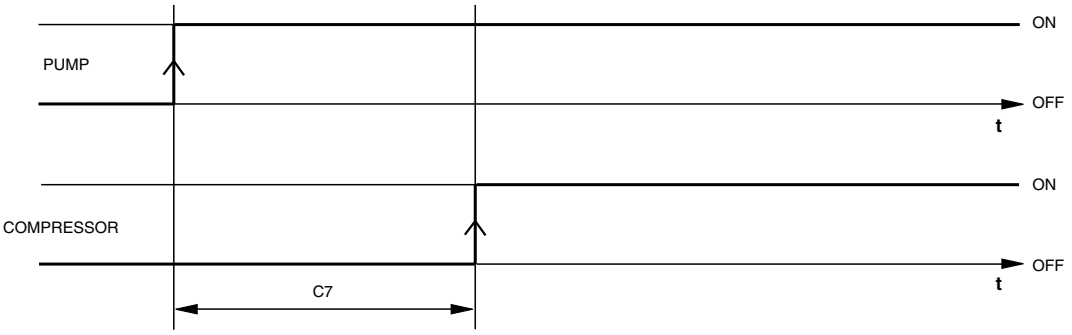

**Minimum time between compressor start-ups**



## Compressor/pump OFF delays

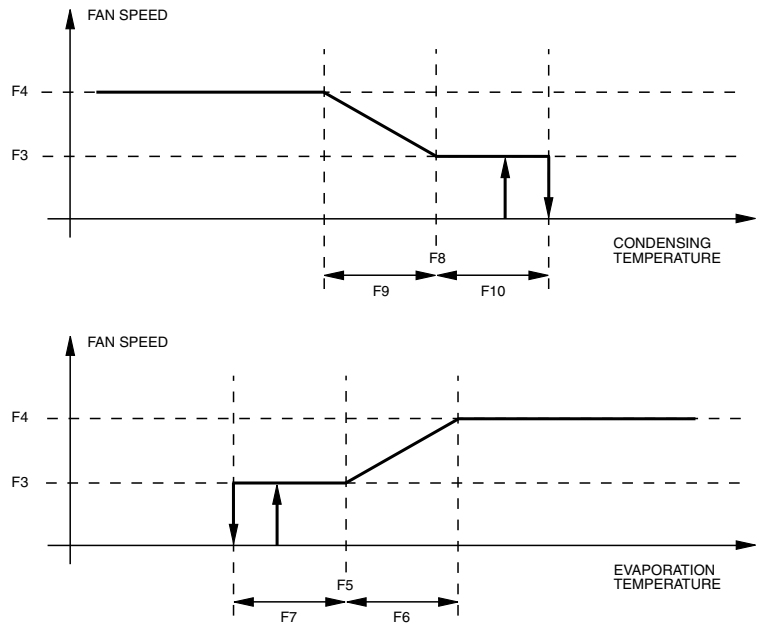



## Pump/compressor start-up delays

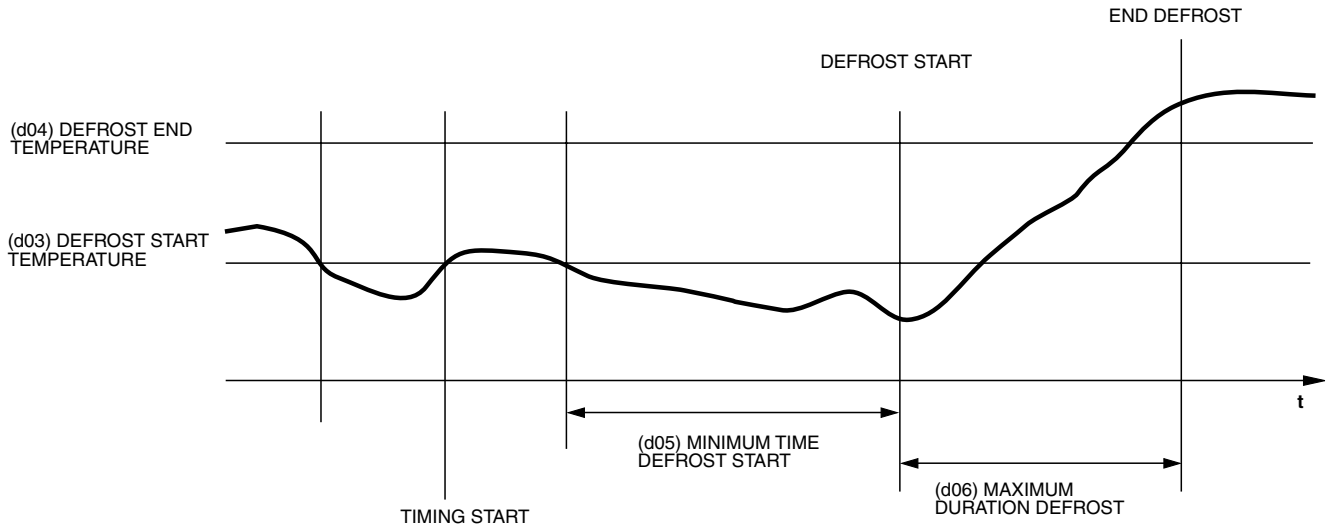


| Parameters related to the fans | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Display** | **Description** | **Level** | **VS** | **Unit** | **Max.** | **Min.** | **Value** |
| **F01** | Fan outlet. 0=absent (function not available);<br>1=present | F | 10 (R/W) | | 1 | 0 | **1** |
| **F02** | Operating mode:<br>0 = always ON (function not available)<br>1 = Parallel with compressor (function not available)<br>2 = ON/OFF operation (function not available)<br>3 = Parallel with compressor and speed adjustment. | U | 48 (R/W) | | 3 | 0 | **3** |
| **F03** | Minimum triac voltage | F | 49 (R/W) | step | F04 | 0 | **50** |
| **F04** | Maximum triac voltage | F | 50 (R/W) | step | 100 | F03 | **75** |
| **F05** | Cold cycle minimum speed temperature<br>Cool cycle minimum speed pressure (1) | F | 24 (R/W) | °C<br>bar | 80 | -40 | **38**<br>**22.2** |
| **F06** | Cool cycle maximum speed temp. differential<br>Cool cycle maximum speed pressure differential (1) | F | 26 (R/W) | °C<br>bar | 50 | 0 | **7**<br>**3.7** |
| **F07** | Diferencial temperatura paro del ventilador ciclo frío<br>Diferencial presión paro del ventilador ciclo frío (1) | F | 28 (R/W) | °C<br>bar | 50 | 0 | **13**<br>**6.5** |
| **F08** | Cool cycle fan OFF differential | F | 30 (R/W) | °C | 80 | -40 | **6** |
| **F09** | Heat cycle minimum speed temperature | F | 32 (R/W) | °C | 50 | 0 | **3** |
| **F10** | Heat cycle maximum speed differential | F | 34 (R/W) | °C | F08 | 0 | **6** |
| **F11** | Fan start-up time | F | 51 (R/W) | sec. | 120 | 0 | **10** |
| **F12** | Triac impulse duration | F | 52 (R/W) | sec. | 10 | 0 | **2** |
| **F13** | Fan management in defrost mode.<br>0 = fan deactivated<br>1 = fan activated in cool cycle mode (function not available)<br>2 = fan deactivated until defrost end temperature is reached and start-up at maximum speed for d16 | F | 53 (R/W) | | 2 | 0 | **2** |
| **F14** | Fan operative at start up with high ambient temperature | U | 91 (R/W) | sec. | 999 | 0 | **30** |

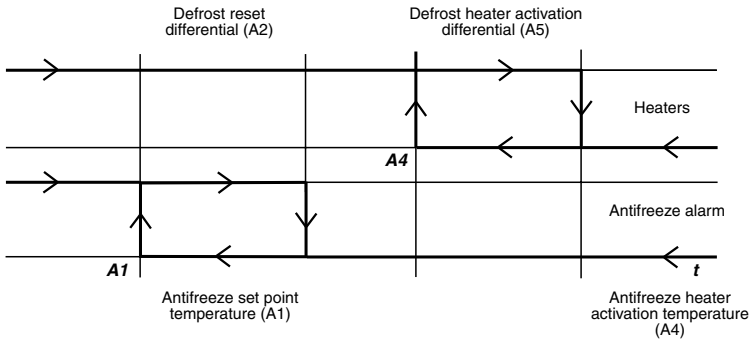
(1) Parameters to be checked when pressure probes are to be used (low ambient kit accessory) YLCA 5 to 15.



| Parameters related to defrost | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Display** | **Description** | **Level** | **VS** | **Unit** | **Max.** | **Min.** | **Value** |
| **d01** | Execution of defrost 0= no (function not available)<br>1= yes. | U | 7 (R/W) | - | 1 | 0 | **1** |
| **d02** | Time or temperature defrost.<br>0= time (function not available).<br>1= temperature / pressure | U | 8 (R/W) | - | 1 | 0 | **1** |
| **d03** | Defrost start temperature / pressure | U | 19 (R/W) | °C<br>bar | d04 | -40/<br>11 | **-3**<br>**6.2** |
| **d04** | Defrost end temperature / pressure | U | 21 (R/W) | °C<br>bar | 80/<br>12 | d03 | **20**<br>**14.4** |
| **d05** | Minimum time for defrost start | U | 37 (R/W) | sec. | 150 | 10 | **10** |
| **d06** | Minimum defrost duration | U | 38 (R/W) | sec. | 150 | 0 | **0** |
| **d07** | Maximum defrost duration | U | 39 (R/W) | Min. | 15 | 1 | **6** |
| **d08** | Time between two defrost cycles | U | 40 (R/W) | Min. | 150 | 10 | **30** |
| **d11** | Activation heaters in defrost<br>0= no.<br>1= yes. | U | 9 (R/W) | - | 0 | 1 | **1** |
| **d12** | Compressor OFF before defrost | F | 43 (R/W) | Min. | 3 | 0 | **1** |
| **d13** | Compressor OFF after defrost | F | 44 (R/W) | Min. | 3 | 0 | **1** |
| **d16** | Time of forced vent after defrost<br>(only if F13=2). | F | 47 (R/W) | sec. | 360 | 0 | **60** |



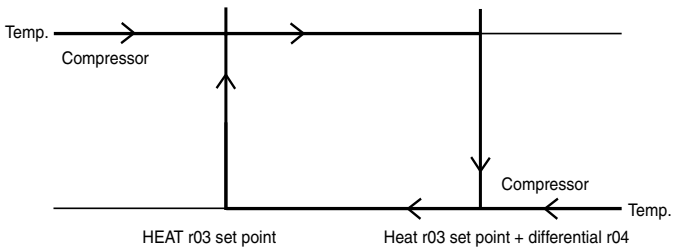
| Parameters related to defrost control configuration | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Display** | **Description** | **Level** | **VS** | **Unit** | **Max.** | **Min.** | **Value** |
| **A01** | Antifreeze control set point temperature | U | 11 (R/W) | °C | - | A07 | **3** |
| **A02** | Antifreeze reset differential | U | 12 (R/W) | °K | 50 | 0.3 | **5** |
| **A03** | Antifreeze alarm bypass time | U | 22 (R/W) | sec. | 150 | 0 | **0** |
| **A04** | Antifreeze heater activation temperature | U | 13 (R/W) | °C | r16 | A01 | **3** |
| **A05** | Antifreeze heater activation differential | U | 14 (R/W) | °K | 50 | 0.3 | **2** |
| **A06** | Backup heater control probe<br>0= control probe<br>1= antifreeze probe | F | 6 (R/W) | - | 1 | 0 | **0** |
| **A07** | Minimum level antifreeze control set point temperature | U | 15 (R/W) | °C | 79 | -40 | **3** |
| **A08** | Heating heater activation set point temperature | U | 16 (R/W) | °C | r15 | A01 | **3** |
| **A09** | Heating heater deactivation set point temperature differential | U | 17 (R/W) | °C | 50 | 0.3 | **3** |
| **A10** | Automatic start-up by antifreeze alarm (Unit Standby)<br>0= function deactivated<br>1= Water pump + heater<br>2= Water pump + heater + compressor (heat pumps only)<br>3= Heater | U | 23 (R/W) | | 3 | 0 | **2** |

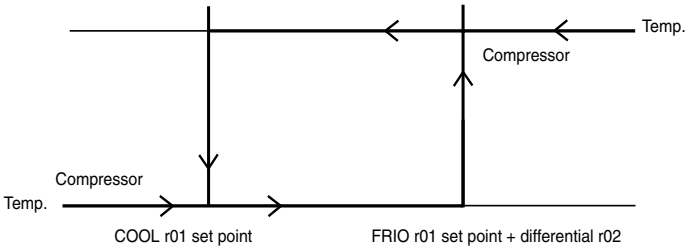


| Parameters for unit configuration | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Display** | **Description** | **Level** | **VS** | **Unit** | **Max.** | **Min.** | **Value** |
| **H01** | Unit model. 2= air-water intake;<br>3= air-water heat pump. | F | 54 (R/W) | | | | **2 (YLCA)**<br>**3 (YLHA PLUS)** |
| **H02** | Number of vent circuits (do not modify this parameter) | F | 12 (R/W) | | | | **0** |
| **H03** | No. of evaporating units present (do not modify this parameter) | F | 13 (R/W) | | | | **0** |
| **H04** | No. of compressors per circuit (do not modify this parameter) | F | 55 (R/W) | | | | **0** |
| **H05** | Pump operation<br>0 = absent<br>1 = Always ON<br>2 = ON upon regulator call<br>3 = On under regulator and time call | F | 56 (R/W) | | 3 | 0 | **1** |
| **H06** | COOL/HEAT digital intake<br>0= Absent. 1= Present | U | 14 (R/W) | | 1 | 0 | **0** |
| **H07** | ON/OFF digital intake<br>0= Absent. 1= Present | U | 15 (R/W) | | 1 | 0 | **0** |
| **H08** | Network configuration (do not modify this parameter) | F | 57 (R/W) | | 3 | 0 | **0** |
| **H09** | Keyboard locked<br>0= Disabled. 1= Abled | U | 16 (R/W) | | 1 | 0 | **1** |
| **H10** | Serial direction for supervision<br>0= Future use as terminal | U | 58 (R/W) | | 200 | 1 | **1** |
| **H11** | Output configuration (not selectable) | F | 59 (R/W) | | 3 | 0 | **0** |
| **H12** | 4-way valve logic operation. Activated in cold cycle<br>(do not modify this parameter) | F | 60 (R/W) | | 3 | 0 | **0** |
| **H21** | Second pump operation (do not modify this parameter) | F | 62 (R/W) | | 4 | 0 | **0** |
| **H22** | Default loading of parameters disabled<br>1= Disabled. 0= Abled | F | 18 (R/W) | | 1 | 0 | **1** |
| **H23** | Modbus protocol setting<br>0= Disabled. 1= Abled | F | 11 | | 1 | 0 | **0** |

| Parameters for alarm configuration | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Display** | **Description** | **Level** | **VS** | **Unit** | **Max.** | **Min.** | **Value** |
| **P01** | Alarm delay by flow switch at start-up. | U | 63 (R/W) | sec. | 150 | 0 | **20** |
| **P02** | Alarm delay by flow switch with unit in operation. | U | 64 (R/W) | sec. | 120 | 0 | **5** |
| **P03** | Alarm delay by low pressure switch at start-up. | U | 65 (R/W) | sec. | 200 | 0 | **60** |
| **P05** | Alarm reset<br>6= Low and high pressure switch manual reset at third activation in one hour. Antifreeze control is manual reset. | F | 67 (R/W) | | | | **6** |
| **P06** | Cool and heat cycle symbol.<br>1= "Sun" heat cycle. "Snow flake" cool cycle.<br>0= "Sun" cool cycle. "Snow flake" heat cycle. | F | 19 (R/W) | | 1 | 0 | **1** |
| **P08** | Digital intake 1 for the flow switch.<br>Do not modify this parameter. | F | 69 (R/W) | | | | **1** |
| **P09** | Digital intake 2 for remote setting Cool/Heat.<br>Do not modify this parameter. | F | 70 (R/W) | | | | **9** |
| **P15** | Low pressure alarm selection.<br>0= Inoperative with compressor OFF.<br>1= Operative with compressor OFF. | F | 76 (R/W) | | 1 | 0 | **1** |
| **P16** | High water temperature alarm of return water. | U | 38 (R/W) | °C | 80 | -40 | **30** |
| **P17** | High temperature delay at start-up. | U | 77 (R/W) | sec. | 250 | 0 | **30** |
| **P18** | High pressure alarm by transducer<br>0= Function disabled. | F | 39 (R/W) | bar | 99.9 | 0.1 | **41** |
| **P19** | Low temperature alarm of return water. | U | 40 (R/W) | °C | 80 | -40 | **10** |
| **P20** | Alarm activation by high or low water temperature at start-up.<br>1= Function abled.<br>0= Function disabled. | U | 20 (R/W) | | 1 | 0 | **0** |

| Parameters for regulator configuration | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Display** | **Description** | **Level** | **VS** | **Unit** | **Max.** | **Min.** | **Value** |
| **r01** | Cool cycle set point temperature | U | 41 (R/W) | °C | r14 | r13 | **12** |
| **r02** | Cool set point temperature differential | U | 42 (R/W) | °C | 50 | 0.3 | **1** |
| **r03** | Heat cycle set point temperature | U | 43 (R/W) | °C | r16 | r15 | **40** |
| **r04** | Heat cycle set point temperature differential | U | 44 (R/W) | °C | 50 | 0.3 | **2** |
| **r06** | Type of adjustment<br>0= Proportional. Intake temperature.<br>1= Proportional + neutral zone. Intake temp.<br>2= Proportional. Output temperature.<br>3= Proportional + neutral zone. Output temp.<br>4= By time + dead zone. Output temperature (chillers only). | F | 79 (R/W) | | 4 | 0 | **0** |
| **r07** | Neutral zone differential | F | 45 (R/W) | °C | 50 | 0 | **1** |
| **r08** | (If r06=4 only) Maximum activation time.<br>Output temperature. | F | 80 (R/W) | sec. | 999 | r09 | **120** |
| **r09** | (If r06=4 only) Minimum activation time.<br>Output temperature. | F | 81 (R/W) | sec. | 999 | c04 | **100** |
| **r10** | (If r06=4 only) Maximum deactivation time.<br>Output temperature. | F | 82 (R/W) | sec. | 999 | r11 | **120** |
| **r11** | (If r06=4 only) Maximum deactivation time.<br>Output temperature. | F | 83 (R/W) | sec. | 999 | c05 | **100** |
| **r12** | (If r06=4 only) Compressor deactivation differential. | F | 46 (R/W) | °C | 50 | 0 | **1** |
| **r13** | Cool cycle minimum set point temperature. | U | 47 (R/W) | °C | r14 | -40 | **6** |
| **r14** | Cool cycle maximum set point temperature. | U | 48 (R/W) | °C | 80 | r13 | **20** |
| **r15** | Heat cycle minimum set point temperature. | U | 49 (R/W) | °C | r16 | -40 | **25** |
| **r16** | Heat cycle maximum set point temperature. | U | 50 (R/W) | °C | 80 | r15 | **45** |
| **r17** | Summer compensation constant | U | 51 (R/W) | - | +5 | -5 | **-0.4** |
| **r18** | Maximum distance set point | U | 52 (R/W) | °K | 20 | 0.3 | **3.2** |
| **r19** | Summer compensation start-up temperature | U | 53 (R/W) | °C | 176 | -40 | **32** |
| **r20** | Winter compensation start-up temperature | U | 54 (R/W) | °C | 176 | -40 | **5** |
| **r27** | Suppression of buffer tank. 0= No suppression. 1= Suppression in cool cycle. 2= Suppression in heat cycle. 3= Permanent suppression. | F | 88 (R/W) | | 3 | 0 | **3** |
| **r28** | Minimum time for determining low charge | F | 89 (R/W) | sec. | 999 | 0 | **210** |
| **r29** | Low charge differential in cool cycle | F | 58 (R/W) | °C | 50 | 0.3 | **3** |
| **r30** | Low charge differential in heat cycle | F | 58 (R/W) | °C | 50 | 0.3 | **4** |
| **r31** | Winter compensation constant | U | 60(R/W) | - | +5 | -5 | **-0.4** |



| Table of alarms | | |
|---|---|---|
| **Display** | **Alarm type** | **Reset** |
| **A1** | Antifreeze alarm | Manual |
| **AHt** | High temp. at start-up (if activated. P20=1) | Automatic |
| **ALt** | Low temp. at start-up (if activated. P20=1) | Automatic |
| **d1-2** | Defrost in operation | - |
| **dF1-2** | Problem in defrost | Automatic |
| **E1** | Probe B1 | Automatic |
| **E2** | Probe B2 | Automatic |
| **E3** | Probe B3 | Automatic |
| **E4** | Probe B4 | Automatic |
| **ELS** | Low supply voltage | Automatic |
| **EHS** | High supply voltage | Automatic |
| **EPr** | Eprom error. Unit in operation. | Automatic |
| **EPb** | Eprom error. At start-up | Automatic |
| **ESP** | Communication failure with expansion module | Automatic |
| **EL** | Problem at fan voltage control | Automatic |
| **FL** | Flow switch / Pump switch | Manual |
| **Hc** | Compressor maintenance alarm | Automatic |
| **HP** | High pressure / Fan heat switch | Manual |
| **Ht** | High water temperature alarm | Automatic |
| **L** | Low charge warning | Automatic |
| **LP** | Low pressure | Manual |

**Reset of alarms**
Pressing the UP and DOWN keys for 5 seconds cancels alarms present in the memory. At the same time, the alarm message disappears from the display and the alarm relay is deactivated.

**Forced defrost (heat pumps)**
Pressing the SEL and UP keys simultaneously for 5 seconds activates forced defrost of the unit.

**Clearing hour counters**
While reading compressor or pump (c10 and c15) operating hours, said counters can be cleared by pressing the UP and DOWN keys simultaneously.

**Pump operation**
4 operating modes can be selected in accordance with the value given to parameter H5. H5=0 (pump disabled), H5=1 (pump permanently on), H5=2 (pump on controlled by the regulator or in parallel with the compressor), H5=3 (pump starts and stops at regular intervals, independent of compressor operation) (parameters c17 and c18).

**Calibration of probes**
If necessary, probes can be calibrated by using parameters /13, /14, /15, and /16, See Parameters related to probes table.

**Remote ON/OFF**
A remote ON/OFF intake can be connected between terminals D5 and B of the connecting strip. To activate said intake, a value of 1 should be given to parameter H07 (H07= 1). With this intake open the unit is OFF; when closed, the unit is ON. This function does not disable the ON/OFF function of the keyboard.

**Remote COOL/HEAT**
A remote COOL/HEAT intake can be connected between terminals D2 and B of the connecting strip. To activate said intake, a value of 1 should be given to parameter H06 (H06= 1). With this intake open the unit is in HEAT; when closed, the unit is in COOL. This function does not disable the COOL/HEAT function of the keyboard.

## Temperature/resistance characteristics of the NTC control probes (10 kOhms)

| Temperature (°C) | Resistance (kOhms) |
|---|---|
| -50 | 329.20 |
| -49 | 310.70 |
| -48 | 293.30 |
| -47 | 277.00 |
| -46 | 261.80 |
| -45 | 247.50 |
| -44 | 234.10 |
| -43 | 221.80 |
| -42 | 209.80 |
| -41 | 198.70 |
| -40 | 188.40 |
| -39 | 178.30 |
| -38 | 168.90 |
| -37 | 160.10 |
| -36 | 151.80 |
| -35 | 144.00 |
| -34 | 136.60 |
| -33 | 129.70 |
| -32 | 123.20 |
| -31 | 117.10 |
| -30 | 111.30 |
| -29 | 106.70 |
| -28 | 100.40 |
| -27 | 95.47 |
| -26 | 90.80 |
| -25 | 86.39 |
| -24 | 82.22 |
| -23 | 78.29 |
| -22 | 74.58 |
| -21 | 71.07 |
| -20 | 67.74 |
| -19 | 64.54 |
| -18 | 61.62 |
| -17 | 58.66 |

| Temperature (°C) | Resistance (kOhms) |
|---|---|
| -16 | 55.95 |
| -15 | 53.99 |
| -14 | 50.90 |
| -13 | 48.66 |
| -12 | 46.48 |
| -11 | 44.41 |
| -10 | 42.45 |
| -9 | 40.56 |
| -8 | 38.76 |
| -7 | 37.05 |
| -6 | 35.48 |
| -5 | 33.89 |
| -4 | 32.43 |
| -3 | 31.04 |
| -2 | 29.72 |
| -1 | 28.47 |
| 0 | 27.28 |
| 1 | 26.13 |
| 2 | 25.03 |
| 3 | 23.09 |
| 4 | 22.09 |
| 5 | 22.05 |
| 6 | 21.15 |
| 7 | 20.20 |
| 8 | 19.48 |
| 9 | 18.70 |
| 10 | 17.98 |
| 11 | 17.24 |
| 12 | 16.55 |
| 13 | 15.90 |
| 14 | 15.28 |
| 15 | 14.68 |
| 16 | 14.12 |
| 17 | 13.57 |
| 18 | 13.08 |
| 19 | 12.58 |
| 20 | 12.09 |
| 21 | 11.83 |
| 22 | 11.20 |
| 23 | 10.78 |
| 24 | 10.38 |
| 25 | 10.00 |

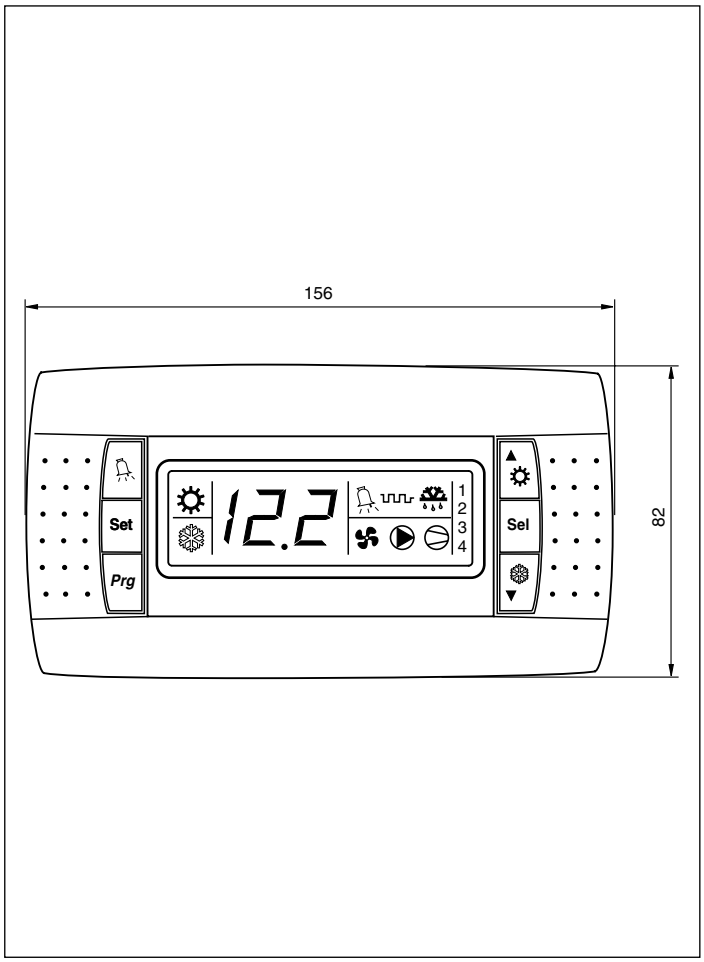
| Temperature (°C) | Resistance (kOhms) |
|---|---|
| 26 | 9.63 |
| 27 | 9.28 |
| 28 | 8.94 |
| 29 | 8.82 |
| 30 | 8.31 |
| 31 | 6.01 |
| 32 | 7.72 |
| 33 | 7.45 |
| 34 | 7.19 |
| 35 | 6.94 |
| 36 | 6.69 |
| 37 | 6.46 |
| 38 | 6.24 |
| 39 | 6.03 |
| 40 | 5.82 |
| 41 | 5.63 |
| 42 | 5.43 |
| 43 | 5.24 |
| 44 | 5.08 |
| 45 | 4.91 |
| 46 | 4.74 |
| 47 | 4.59 |
| 48 | 4.44 |
| 49 | 4.30 |
| 50 | 4.16 |
| 51 | 4.02 |
| 52 | 3.80 |
| 53 | 3.77 |
| 54 | 3.65 |
| 55 | 3.53 |
| 56 | 3.42 |
| 57 | 3.31 |
| 58 | 3.21 |
| 59 | 3.11 |
| 60 | 3.02 |
| 61 | 2.92 |
| 62 | 2.83 |
| 63 | 2.75 |
| 64 | 2.66 |
| 65 | 2.58 |
| 66 | 2.51 |
| 67 | 2.43 |

| Temperature (°C) | Resistance (kOhms) |
|---|---|
| 68 | 2.36 |
| 69 | 2.29 |
| 70 | 2.22 |
| 71 | 2.16 |
| 72 | 2.10 |
| 73 | 2.04 |
| 74 | 1.98 |
| 75 | 1.92 |
| 76 | 1.87 |
| 77 | 1.81 |
| 78 | 1.76 |
| 79 | 1.71 |
| 80 | 1.66 |
| 81 | 1.62 |
| 82 | 1.57 |
| 83 | 1.53 |
| 84 | 1.49 |
| 85 | 1.45 |
| 86 | 1.41 |
| 87 | 1.37 |
| 88 | 1.33 |
| 89 | 1.30 |
| 90 | 1.26 |
| 91 | 1.23 |
| 92 | 1.20 |
| 93 | 1.16 |
| 94 | 1.13 |
| 95 | 1.10 |
| 96 | 1.06 |
| 97 | 1.05 |
| 98 | 1.02 |
| 99 | 0.99 |
| 100 | 0.97 |
| 101 | 0.94 |
| 102 | 0.92 |
| 103 | 0.90 |
| 104 | 0.87 |
| 105 | 0.85 |
| 106 | 0.83 |
| 107 | 0.81 |
| 108 | 0.79 |
| 109 | 0.77 |

# Accessories

## Remote terminal

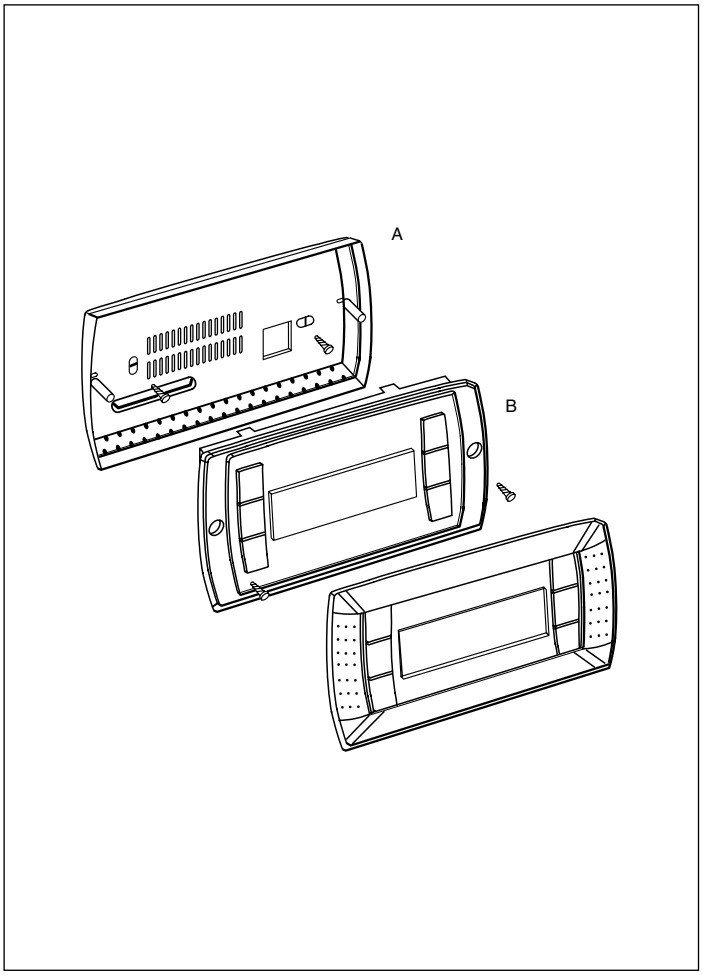
This accessory allows remote control and supervision of the air conditioning unit (up to 1040 m.). Functions are the same as the standard control panel keyboard. This remote terminal is compatible with said keyboard, and the air conditioning unit can be accessed from both devices. For this application, it must be connected to the system by means of the RS485 *serial line connection accessory.*




**Wall-mounting**

For wall-mounting, the rear support (A) must be fastened to a standard three-switch modular box.

- Fasten the rear of the casing to the box by means of the two round head screws.
- Connect the telephone cable.
- Lean the control unit on the rear casing and fasten by means of the two flat head screws (B).
- Fasten the front panel by applying slight pressure.



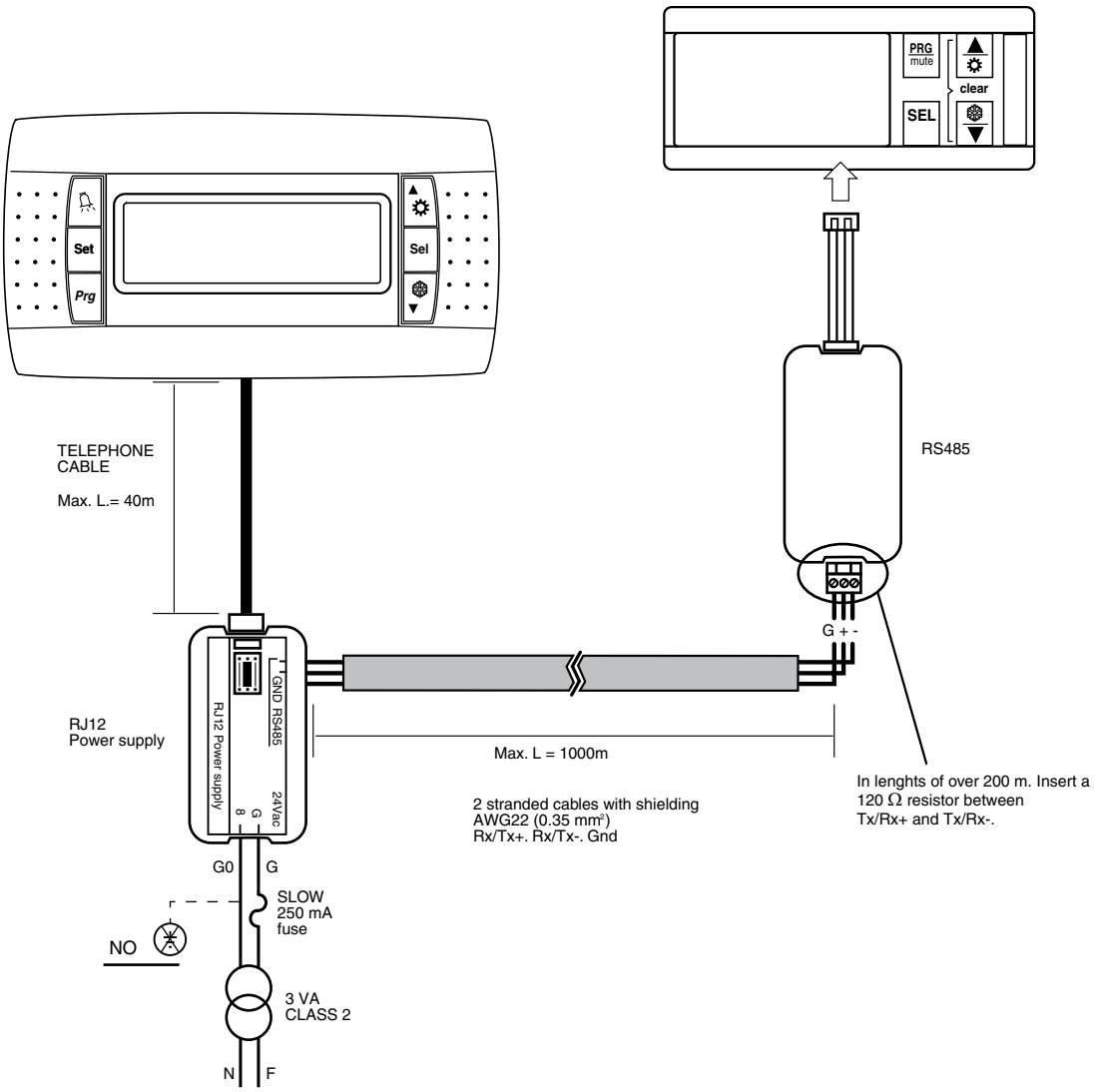

**Wiring**

Connect the RS485 serial device (separate accessory) to the RJ12 *power supply* outlet (included with the remote terminal) and to the electric panel keyboard supervising connection, by using shielded cable. Power terminals G-G0 by means of a transformer and a 250mAT fuse as per the diagram enclosed. Carry out connection between *power supply* RJ12 and the remote terminal, using the telephone cable supplied (80 cms.). This cable can be replaced by a longer cable of up to a maximum of 40 m.

***Attention:***

- Use safety transformers only (3VA, class 2).
- For safety purposes, a 250mA slow fuse should be inserted in series with the G terminal.
- Do not ground transformer secondary.

| | |
|---|---|
| *Maximum distance to RS485* | *1 km. (insert a 120-ohm 1/4W resistor in RS485)* |
| *Speed* | *19.200 bauds* |
| *Cable characteristics* | *2 stranded cables with shielding* |
| *Cable section* | *AWG22 (0.35 mm²)* |
| *Capacity per metre* | *>90pF/m (for example. BELDEN 8761-8762 cable)* |




**Installation**

No configuration is necessary for the remote terminal to be operative, because the terminal operates whatever the control serial direction might be (can be selected by means of parameter H10). At start-up, the screen will display the control version. After 4 seconds, all symbols will be displayed. Should the connection to the RS485 not be correct, or the control unit is set to *OFF*, the message offline is displayed.

**Info mode**

Pressing the up, down and sel keys simultaneously for over 6 seconds, four lines are displayed with information on the system and communications.

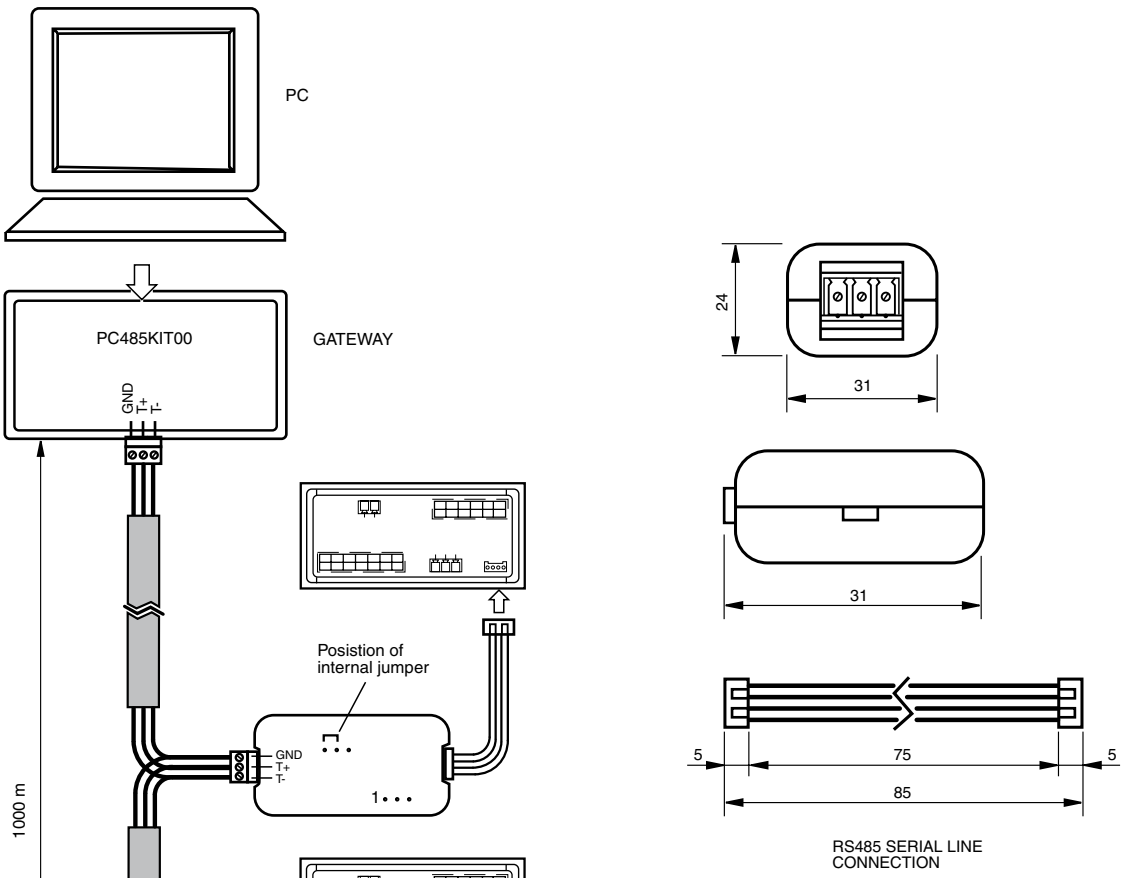
| | |
|---|---|
| *Line 1* | *Terminal version* |
| *Line 2* | *Control unit version* |
| *Line 3* | *Control supervision direction* |
| *Line 4* | *Error percentage between the terminal and the control unit* |

**Connecting serial line RS485**

This accessory allows connecting the air conditioning unit to a serial line RS485 supervision network. It must also be used to install the remote terminal accessory.

**Mounting**

Connect the accessory to the four-pole socket base at the lower right angle of the module with display and keyboard. Use the 4-cable connector supplied. Connect to the supervising system as indicated in the drawing below.
The series should be terminated by connecting a 120-ohm 1/4W resistor between terminals TxRx+ and TtxRx-.




***Attention:***

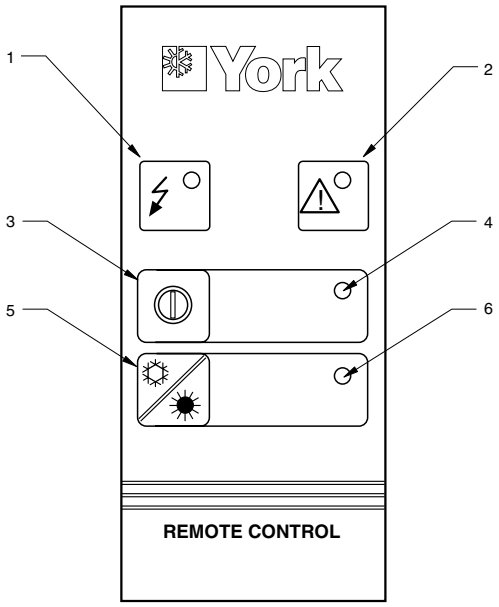
- *Secure the device inside the electric panel so as to avoid accidental disconnection.*
- *Interconnect after having turned power supply off first.*
- *Keep the serial connection cables away from the power supply cables.*

| | |
|---|---|
| *Maximum distance supervision* | *1000 m. (insert a 120-ohm 1/4W resistor in the last RS485 connection)* |
| *Speed* | *19.200 bauds* |
| *Cable characteristics* | *2 stranded cables with shielding* |
| *Cable section* | *AWG22 (0.35 mm²)* |

## Remote control unit

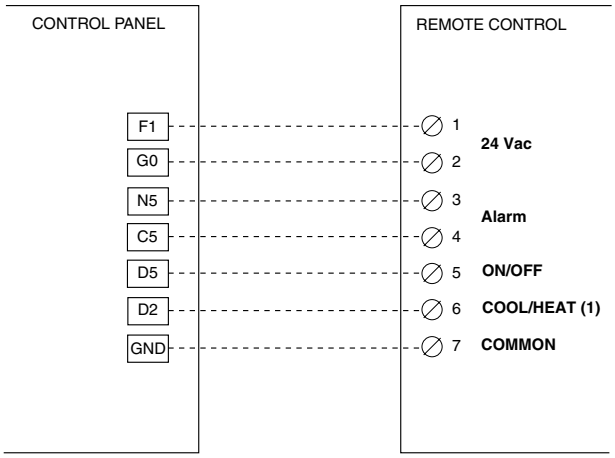
Wall-mounted, with keys for COOL/HEAT and ON/OFF functions. Includes voltage, alarm and COOL/HEAT LEDs. Prior to installation, value 1 must be given to parameters H06 and H07.

1- Voltage LED
2- Alarm LED
3- ON/OFF selection button
4- Unit ON LED
5- COOL/HEAT selection button
6- LED on in heat function/
LED off in cool function.




- The remote control unit can be located at a maximum distance of 50 m.
- Minimum cable section should be 0.35 mm$^2$.
- Avoid passing control cables near power supply cables.

### Connection to control panel




(1) On heat pump units only

## Buffer Tank YLCA/YLHA PLUS 5, 7, 9, 12 and 15

For installations with small water volumes in wich it is necessary to increase thermal inertia.
The installation of this unit achieves greater pressure in the water temperature of the installation and lowers the on/off cycles of the compressor.

### Casing

Made up of screwed-on detachable panels that give access to the internal components. These panels are made of aluminium steel, painted electrostatic with epoxy-polyester powdered paint with a thickness of 60 microns to insure efficient protection of the entire surface.

### Tank

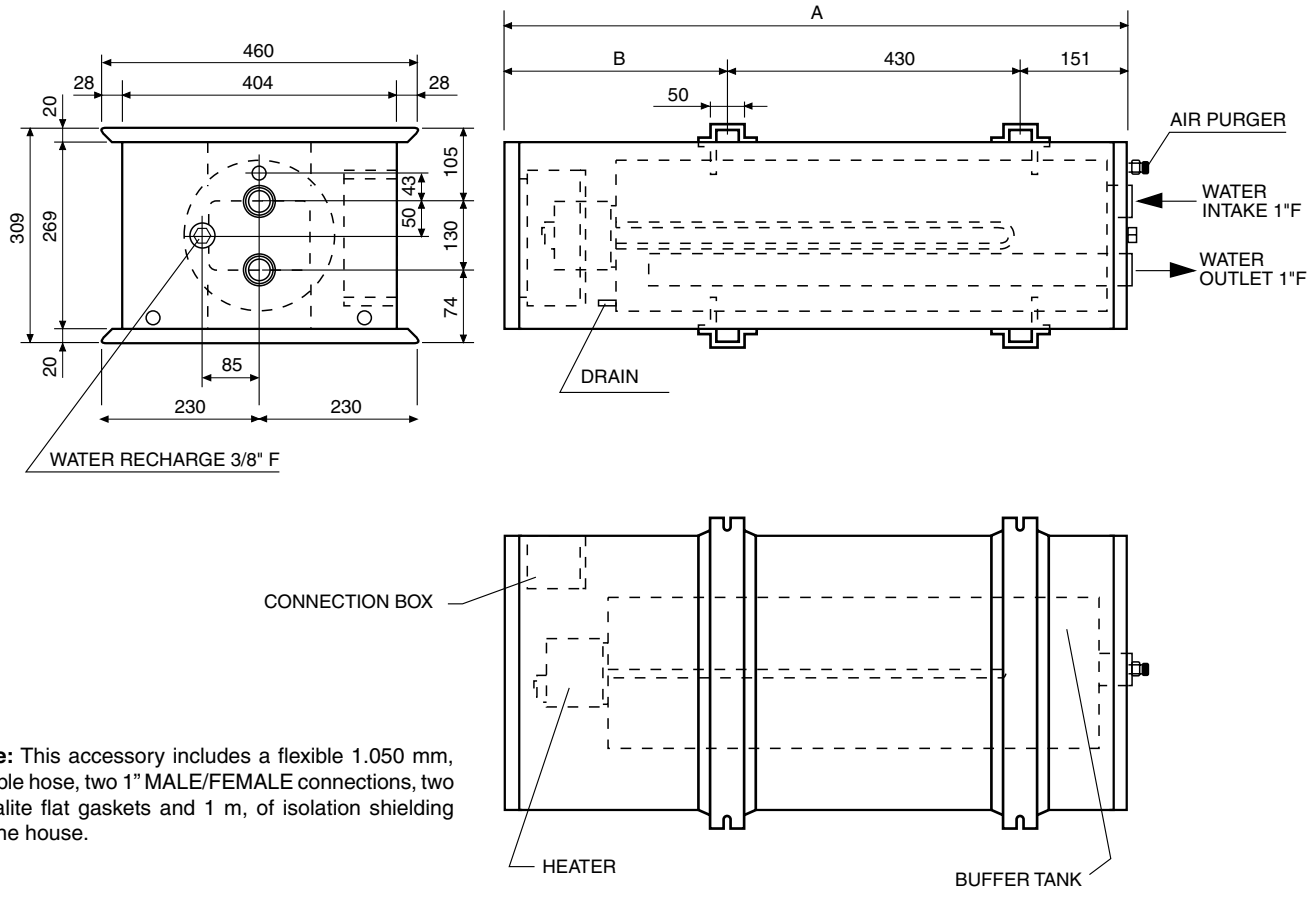
Made of steel sheeting and galvanized by immersion. It is coated with 10 mm, thick closed cell reticulated expanded polyethylene and an a coat of embossed aluminium. There is an air bleeder at the top and two connections for draining and charging the circuit in the middle and bottom. This tank allows a maximum pressure of 6 bar.

### Location

It can be installed horizontally or vertically, away from the cooling unit.
It can be located directly on the floor, both indoors as well as outdoors.

### Backup heater (YLHA PLUS)

Tanks with a backup heater are available. See the variant chart. These tanks can be controlled by the main regulator of the heat pump it self.
These kits have an electric connecting box inside.




**Note:** This accessory includes a flexible 1.050 mm, flexible hose, two 1" MALE/FEMALE connections, two Curalite flat gaskets and 1 m, of isolation shielding for the house.

| Buffer tank | A | B |
|---|---|---|
| 20 litres | 907 | 326 |
| 30 litres | 1007 | 426 |

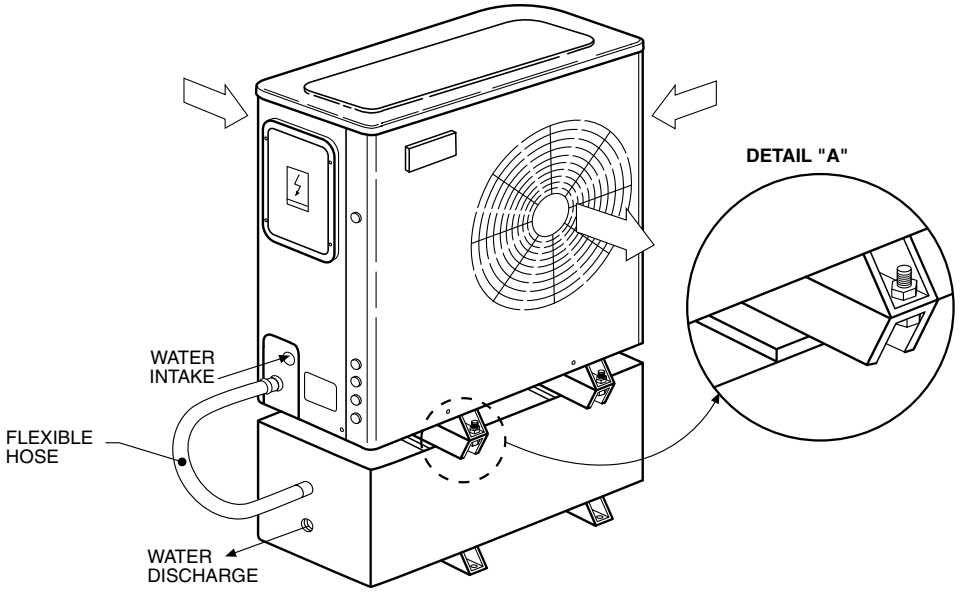
**Pressure drop of the 20 and 30 (kPa) buffer tanks (Including interconnecting flexible hose)**

| Flow (l/h) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1000 | 1250 | 1500 | 1750 | 2000 | 2250 | 2500 | 2750 | 3000 | 3250 | 3500 | 3750 | 4000 | 4250 | 4500 |
| 0 | 0.5 | 1.2 | 2.2 | 3.4 | 4.8 | 6.1 | 7.6 | 9 | 10.8 | 12.8 | 14.9 | 17.1 | 19.3 | 21.6 |

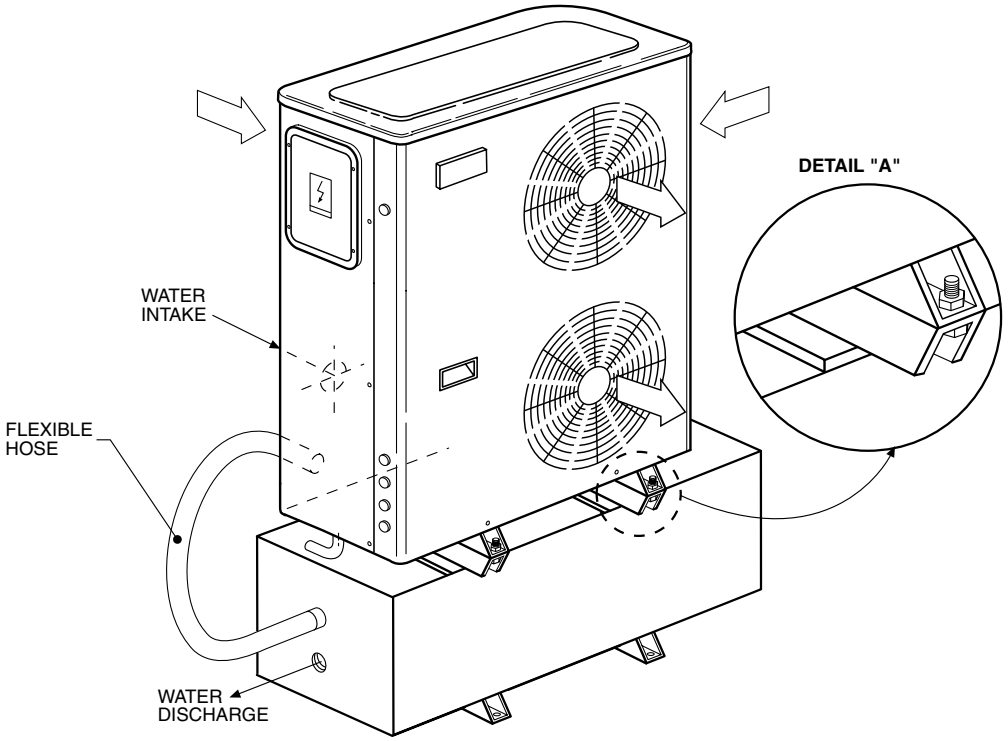
**Variants**

| Units | Buffer tank | Heater |
|---|---|---|
| **5, 7, 9** | 20 litres | - |
| **9, 12, 15** | 30 litres | - |
| **5, 7** | 20 litres | 2 kW/230M |
| **5, 7** | 20 litres | 3 kW/230M |
| **7, 9** | 20 litres | 3 kW/400T |
| **9, 12** | 30 litres | 4.5 kW/400T |
| **12, 15** | 30 litres | 6 kW/400T |

**Mounting on 5, 7 and 9 units**




**Mounting on 12 and 15 units**




1. Fasten the buffer tank to the unit (Detail A) by means of the screws supplied with the accessory.
2. Hydraulically interconnect the buffer tank to the unit by means of the flexible hose, the two other hoses and the two Curalite gaskets supplied with the accessory. Cover the hose with isolation.

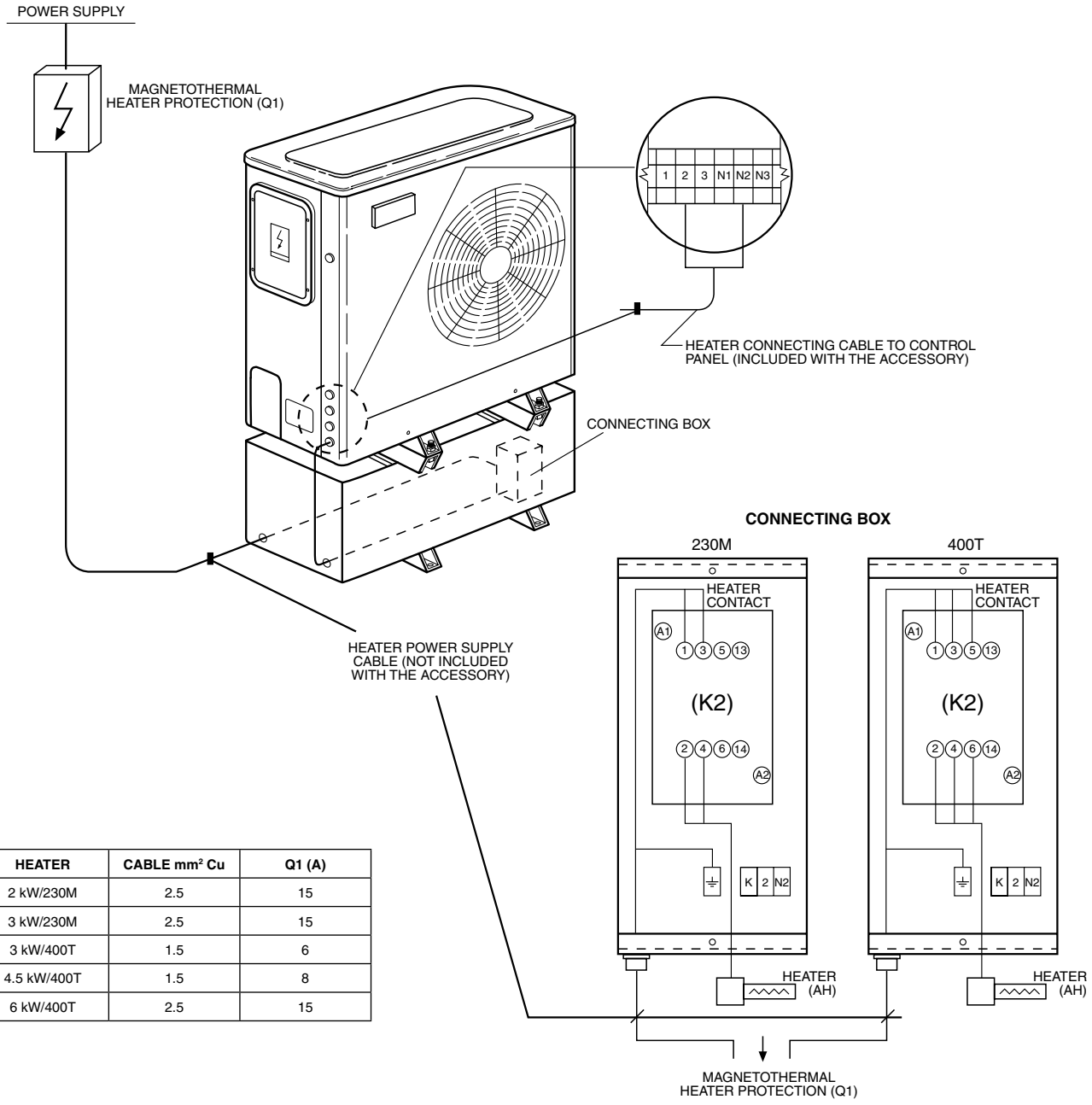
**Attention:**

⚠ Before starting the system, purge the air from the tank and the hydraulic circuit.

If an electric heater is installed, do not power the unit until the circuit if full of water.

The heater includes a manual restart thermostat set to 95° C.

**WIRING OF THE HEATER**
**(See wiring diagram of the unit)**




| HEATER | CABLE mm² Cu | Q1 (A) |
|---|---|---|
| 2 kW/230M | 2.5 | 15 |
| 3 kW/230M | 2.5 | 15 |
| 3 kW/400T | 1.5 | 6 |
| 4.5 kW/400T | 1.5 | 8 |
| 6 kW/400T | 2.5 | 15 |

## 115 Litre Buffer Tank for YLCA/YLHA PLUS 20 and 27

Adequate for installations with low water volume and need to have increased thermal inertia.
This application achieves improved water temperature in the installation and decreases the on and off cycles of the compressor.

### Casing

Made up of screwed-on detachable panels that give access to the internal components. These panels are made of aluminium-coated steel sheeting with a 60 micron coating of epoxy-polyester powdered paint, that assures efficient protection of the entire surface.

### Tank

Made of steel sheeting and galvanized by immersion. It is coated with 10 mm, thick, closed cell, reticulated and expanded polyethylene, and a coat of embossed aluminium. At the top it has an automatic bleeder, and two manual valves at the bottom for draining and recharging the circuit. This tank allows a maximum pressure of 6 bar.

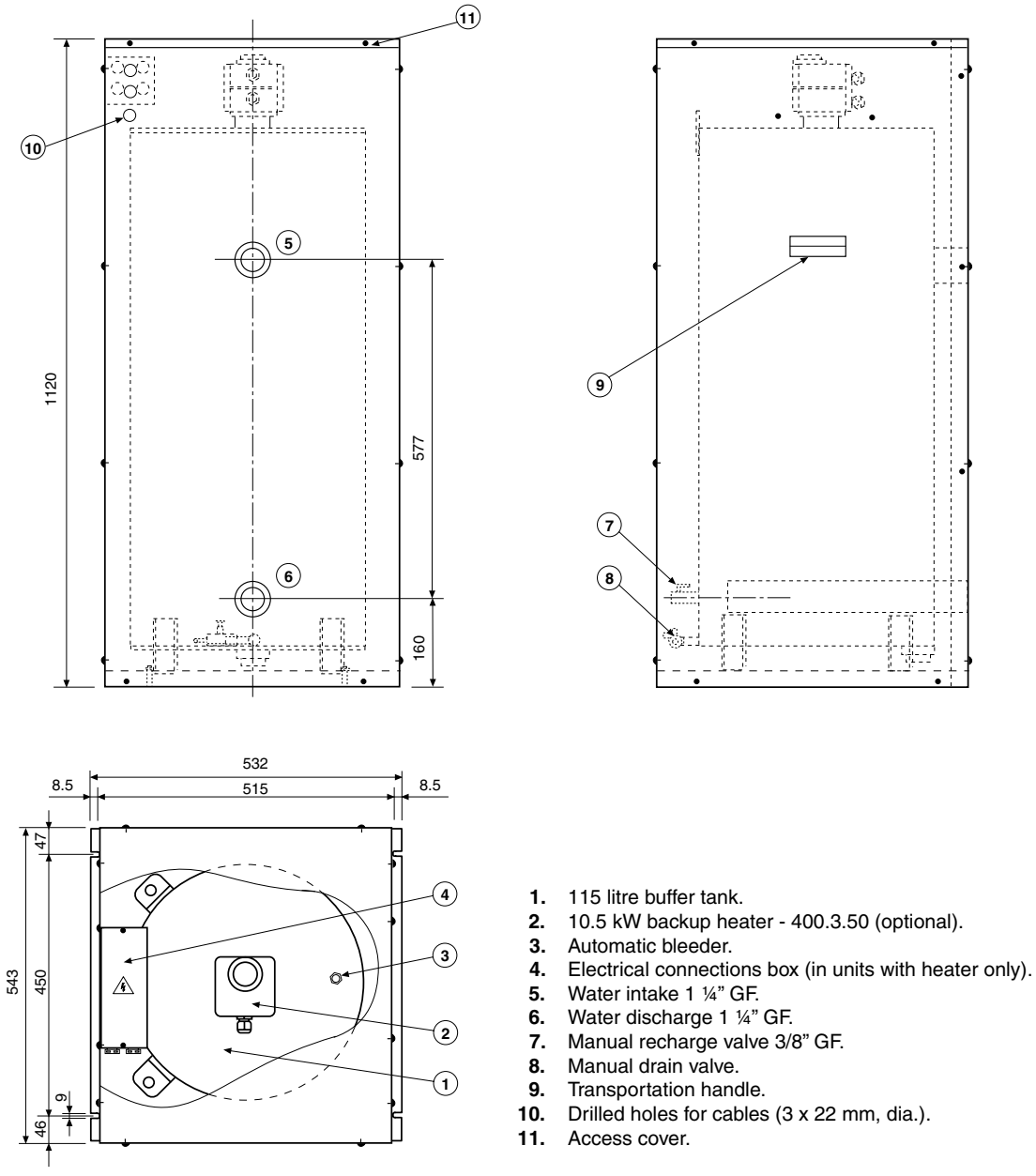
### Location

It should always be installed in vertical position. It can be placed directly on the floor, both indoors as well as outdoors.

### Backup heater (YLHA PLUS)

There are tanks available with a 10.5 kW (400.3.50) backup heater that can be controlled by the main regulator of the heat pump itself.
These kits have an internal electrical connections box.

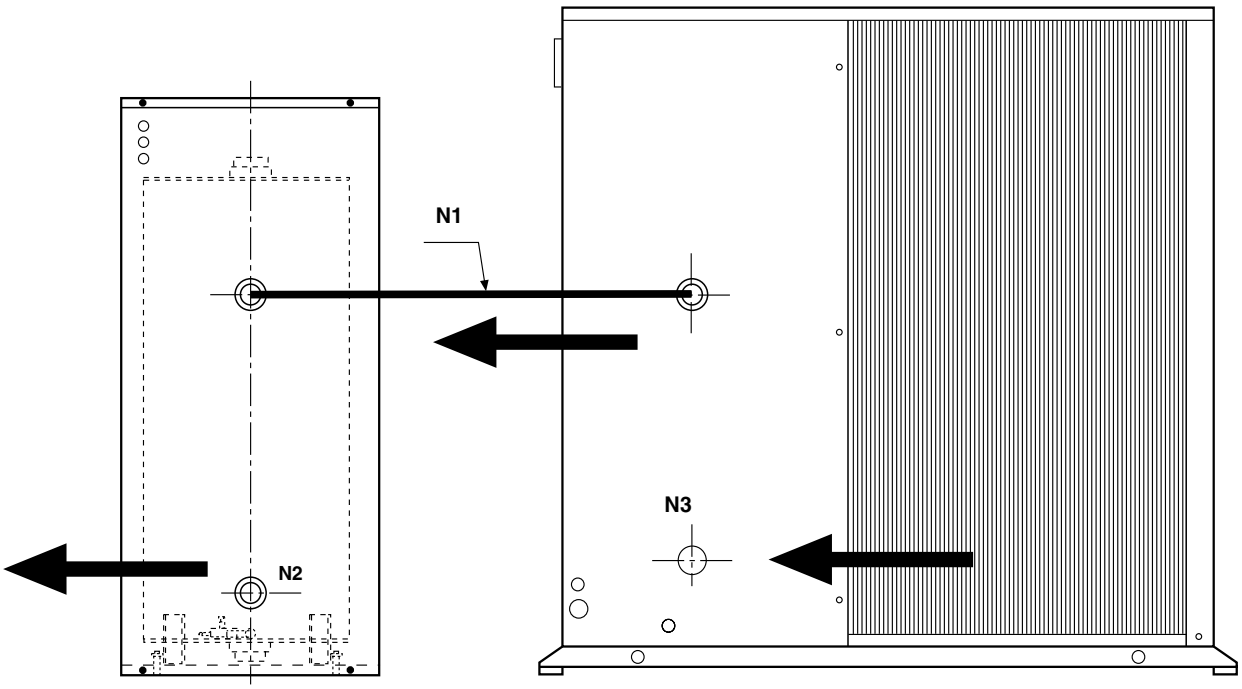
**General dimensions mm.**




1. 115 litre buffer tank.
2. 10.5 kW backup heater - 400.3.50 (optional).
3. Automatic bleeder.
4. Electrical connections box (in units with heater only).
5. Water intake 1 ¼" GF.
6. Water discharge 1 ¼" GF.
7. Manual recharge valve 3/8" GF.
8. Manual drain valve.
9. Transportation handle.
10. Drilled holes for cables (3 x 22 mm, dia.).
11. Access cover.

## Hydraulic connections

### YLCA/YLHA PLUS 20 and 27




**N1.** Interconnecting tubing (must be insulated to avoid condensation)
**N2.** Water outlet.
**N3.** Water intake.

**Wiring of the heater**

- Prior to installation, power off the YLHA PLUS units.
- Do not power on again until installation is finished and with the tank full of water.

**AH** - 10.5 Kw backup heater (400.3.50).

**BT** - Buffer tank.

**EBBT** - Buffer tank connections box.

**EBHP** - YLHA PLUS connections box.

**K2** - Heater contactor.

**Q1** - Thermomagnetic protector of the heater.

**Installation**

**N1** - Remove the top cover of the tank.

**N2** - Remove the cover of the connections box.

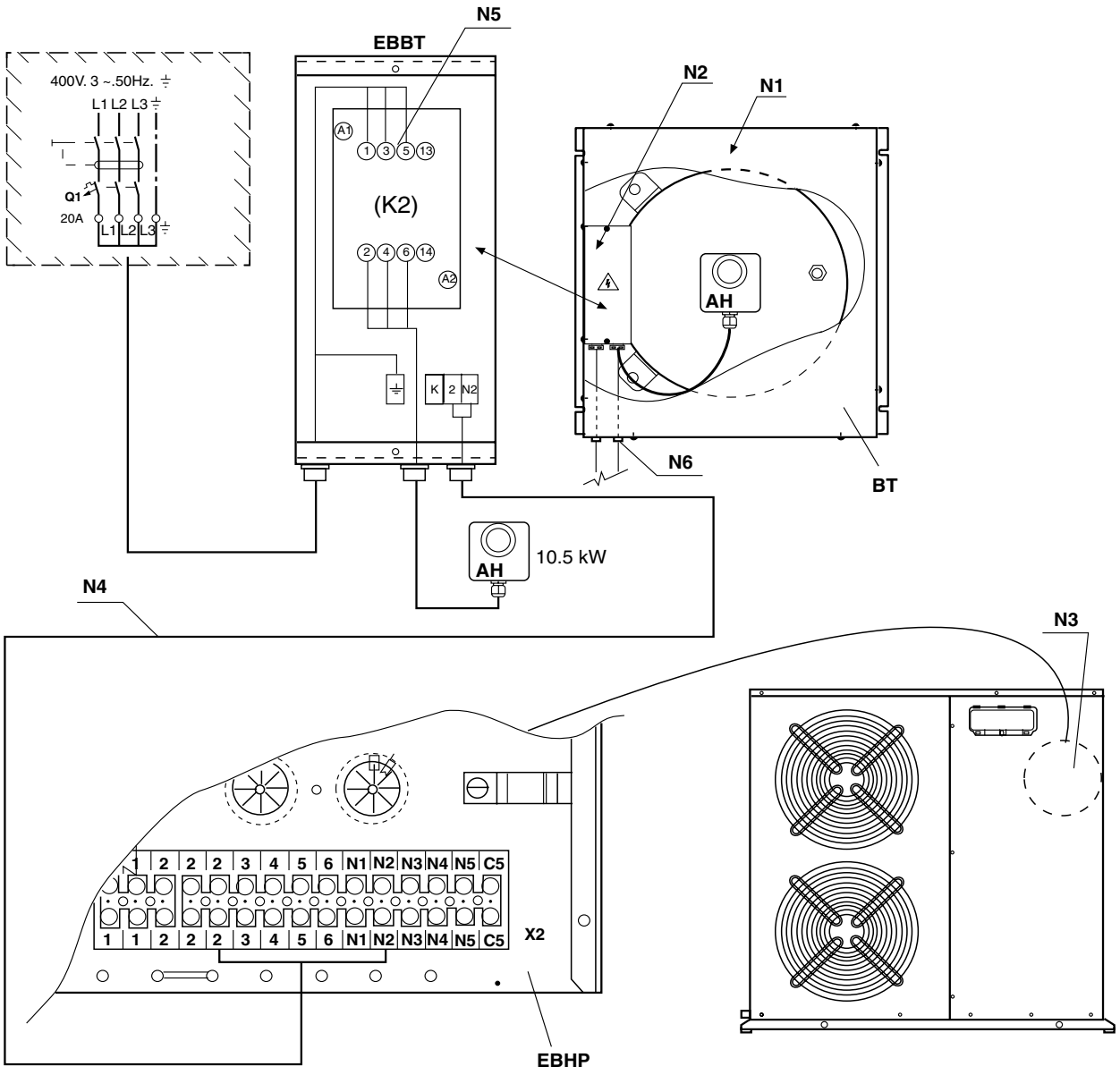
**N3** - Remove the cover of the YLHA PLUS control box.

**N4** - Connect terminals 2 and N2 of the tank connections box to the corresponding terminals in the YLHA PLUS electrical connections box.

**N5** - Connect terminals 1, 3 and 5 of contactor K2 and ground of the tank electric box to the power supply. For this purpose, use 2.5 mm² Cu cable and a thermomagnetic 20 amp switch.

**N6** - Pass the cables through the tank the corresponding drilled holes.

**Wiring of the heater**



## High pressure fan YLCA/YLHA PLUS 5-27

### Units 5, 7 and 9

This accessory includes:
- 1 fan.
- 1 connecting nozzle for fitting on the front panel.
- 1 condenser for fitting on the control box.
- 1 4A magneto thermal switch.

### Units 12, 15, 20 and 27

This accessory includes:
- 2 fans.
- 2 connecting nozzles for fitting on the front panel.
- 2 condensers for fitting on the control box.
- 1 6A magneto thermal switch.

### Installation

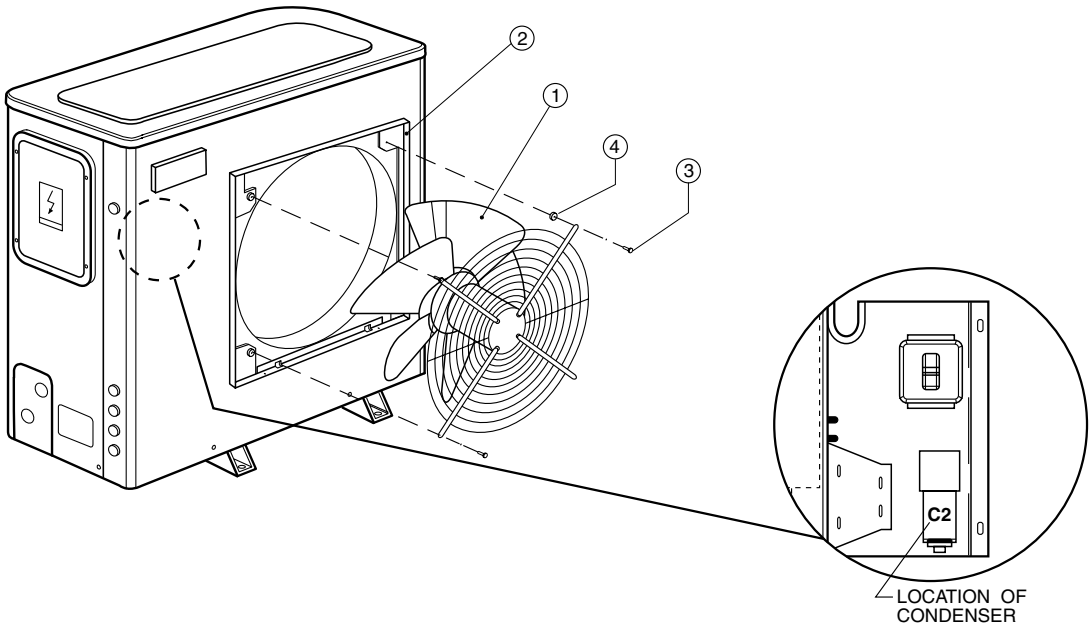
1. Disconnect the electric cables of the standard fan from their connecting points on the control box.
2. Replace the standard fan condenser with the condenser supplied with the accessory.
3. Remove the standard fan from its housing. Save the screws and rubber supports.
4. Fit the high pressure fan (1), inserting the duct nozzle (2) between the supporting panel and the fan grid. Replace the same rubber supports (4) and screws (3). See enclosed diagram.
5. Connect the high pressure fan electric cables to the same points where the standard fan was connected.
6. Substitute magneto thermal switch Q3.
7. Check operation and correct centring of the turbine, if necessary.

### Characteristics of the high pressure fans

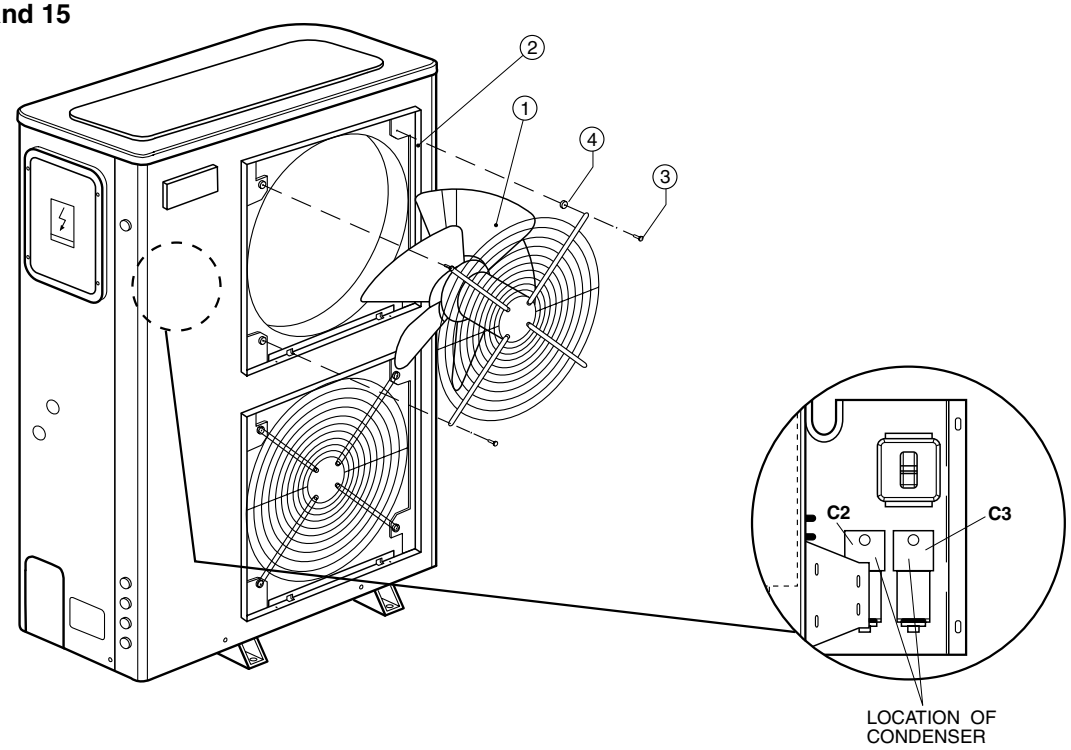
| Units | AVAILABLE PRESSURE (Pa) | RPM | Lw (Db) MAX. SPEED | DUCT DIMENSIONS (mm) | FAN QUANTITIES |
|---|---|---|---|---|---|
| 5 | 60 | 1 390 | 78 | 502 x 502 | 1 |
| 7 and 9 | 45 | 1 390 | 78 | 502 x 502 | 1 |
| 12 and 15 | 45 | 1 390 | 81 | 502 x 1 104 | 2 |
| 20 | 45 | 1 390 | 81 | 502 x 1 104 | 2 |
| 27 | 40 | 870 | 79 | 610 x 1 215 | 2 |
| 40 | 130 | 1 370 | 84 | 2 x Diam. 600 | 2 |

### Installation details

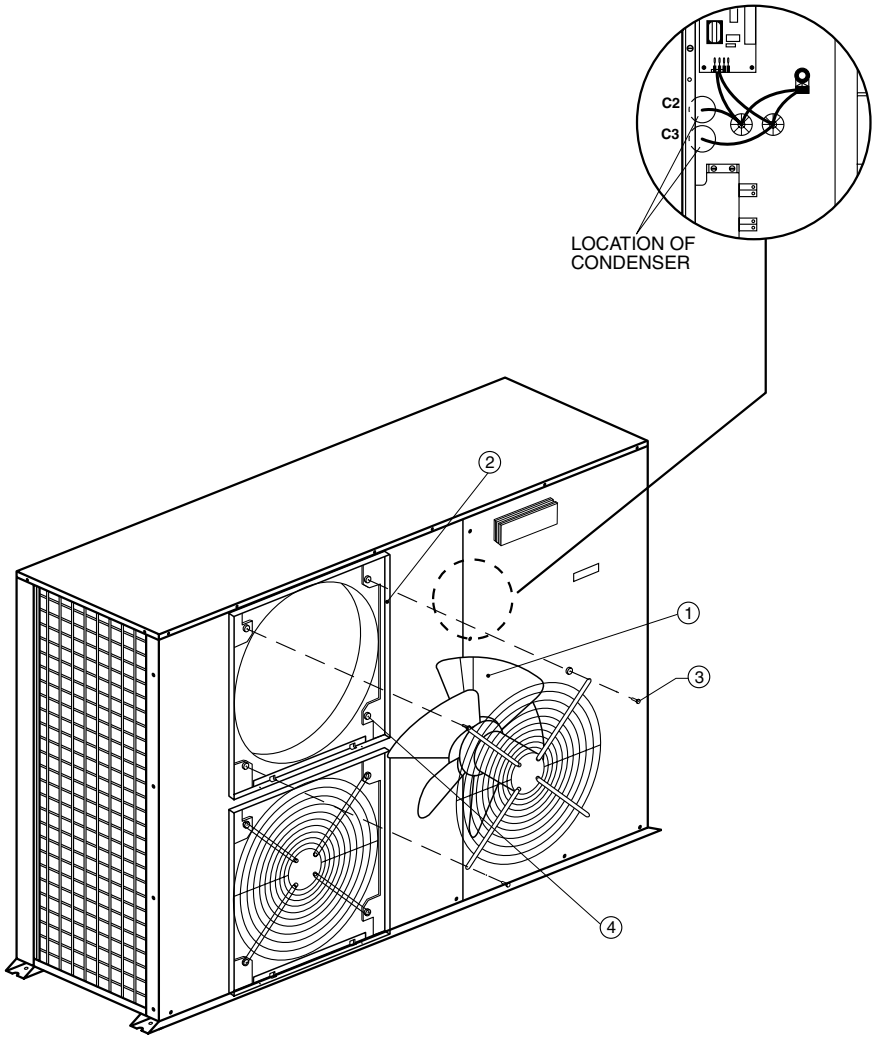
**Units 5, 7 and 9**



**Units 12 and 15**




**Units 20 and 27**



## Low ambient temperature kit (ratiometric pressure transducer) YLCA 5-15

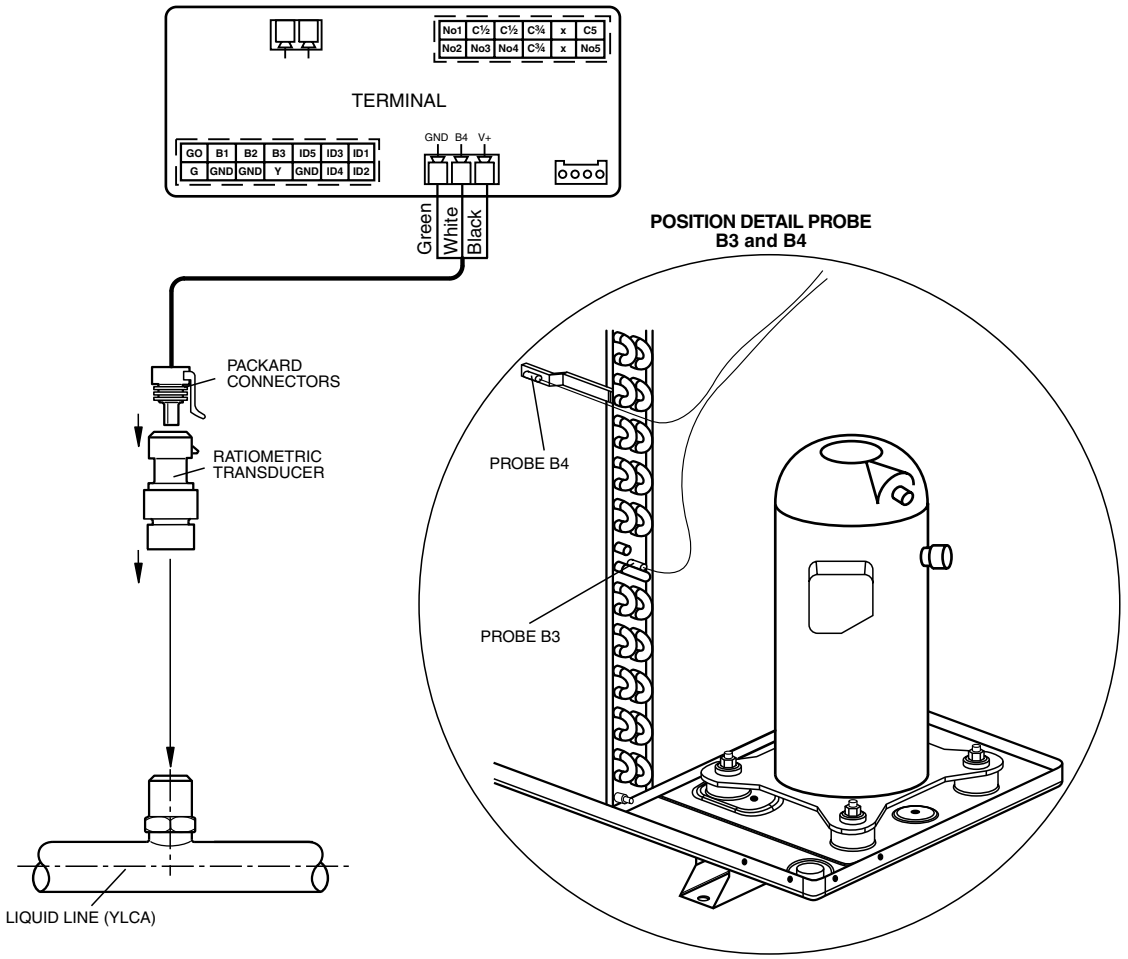
To adjust condensing pressure at low ambient temperatures (down to -18° C).

The kit is comprised of:
1 ratiometric pressure transducer.
1 Packard connector.
1 three-way connector.

**Attention:** Install the kit with power supply to the unit turned off.

**Mounting pressure transducer on the cooling circuit**
Screw the ratiometric transducer on to the free Schrader valve located on the liquid line (YLCA). Check for leaks.

**Mounting the Packard connector**
Connect the three Packard connector cables to the three-way connector and at the regulator module as indicated below.




**Eliminate probe B3**
Disconnect and remote probe B3 from the connecting strip located on the coil (condensation/evaporation control).

**Replace outdoor probe B4**
Disconnect outdoor probe B4 from the rear of the control module and reconnect it to the terminals that were occupied by probe B3 (GND-B3). With this change, this probe becomes B3.

**Connection of the pressure transducer**
Connect the pressure transducer to the three-way connector that was occupied by B4, which is located at the rear of the controller. Now this transducer becomes probe B4.

**Modifying parameters**
- Power the system.
- Select standby on the regulator.
- Enter the parameter programming system by means of the password.
- Modify and check the following parameters in accordance with the values indicated: /03= 2; /04= 3; F05= 22.2; F06= 3.7; F07= 6.5; P18= 41.

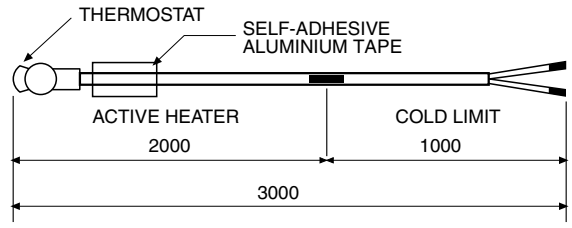
Start the unit and check operation.

## Tray heater YLHA PLUS 5-15

This flexible cable heater can be used in cold climates to avoid the forming of ice and the subsequent obstruction at the tray drain of the heat pumps.

**This accessory includes:**
1 Flexible cable heater with a thermostat.
2 m, of 50 mm, self-adhesive aluminium tape.

**Heater characteristics**
Current: 230.1.50
Power: 80 W
Total length: 3 000 mm
Active heater length: 2 000 mm (contact with the coil)
Cold limit: 1 000 mm (open-air cable and connecting strip connection)
Heater activation temperature: Indoor ambient 4° C.




## Installation

N1- With the power supply turned off. remove the front panel and the compressor chamber corner piece.

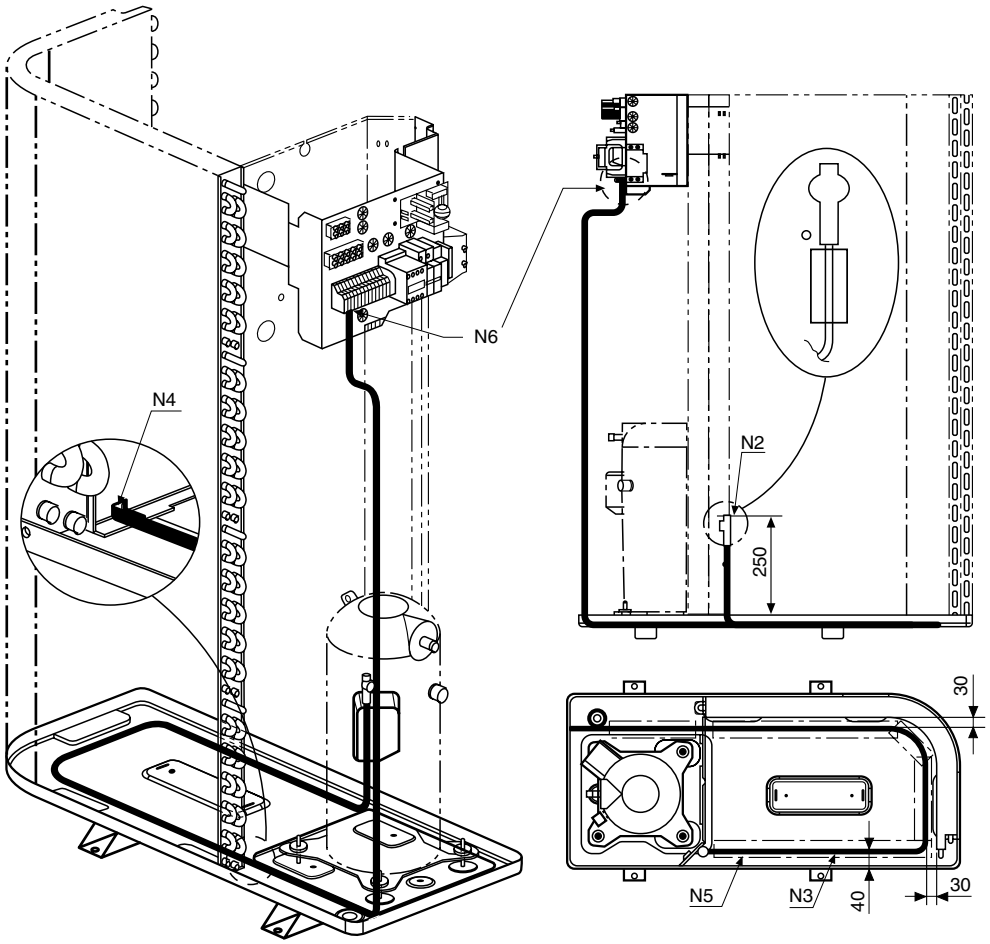
N2 - Fasten the end with the thermostat to the separating panel of the fan chamber, at the indicated level. Use the 3.5 mm dia.
To fasten said end, us the section of self-ashesive aluminium tape installed.

N3- Locate the cable heater over the tray, at the indicated elevation.

N4 - Pass the cable heater to the compressor chamber through the rectangular hole at the base of the separating panel. Make sure the cable heater reaches the tray drain.

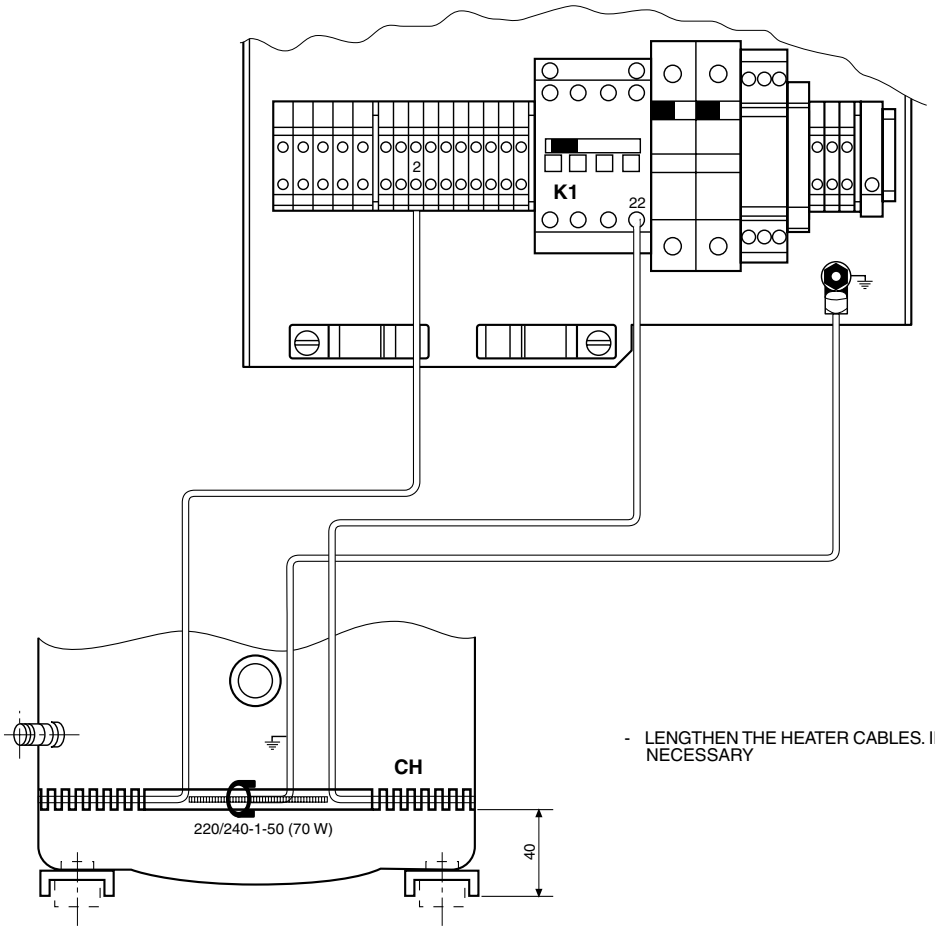
N5 - Fasten the cable heater to the tray with the self-adhesive aluminium tape supplied. Avoid covering the tray drain.

N6 - Connect the two terminal cables of the heater to terminals L1 and N (230.1.50) of the connecting strip.

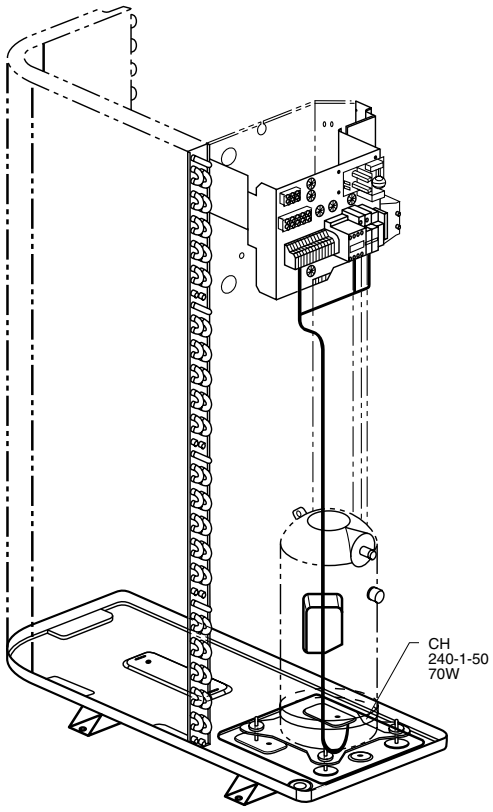


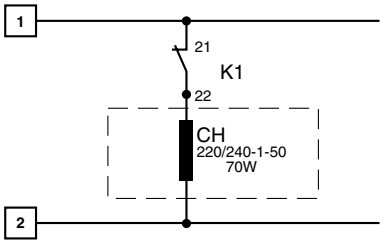
## Compressor heater YLHA PLUS 5 - 15

**Assembly**




- LENGTHEN THE HEATER CABLES. IF NECESSARY




CH - COMPRESSOR HEATER
K1 - COMPRESSOR CONTACTOR

All data and measurements are subject to change without prior notice.

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